Disclaimer

The tender contract to conduct the State-wide Evaluation of the Chronic Disease Management Program was awarded to a consortium by NSW Health in February 2011. The consortium is be led by the George Institute for Global Health, together with the Centre for Primary Health Care and Equity at the University of New South Wales, and the Centre for Health Economics Research and Evaluation at the University of Technology.

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Table of Contents

Acronyms ........................................................................................................................................ vi
List of Tables .................................................................................................................................. vii
List of Figures ................................................................................................................................. viii
Executive Summary ......................................................................................................................... xiii

1 BACKGROUND .......................................................................................................................... 31
1.1 Origins of the Chronic Disease Management Program .......................................................... 31
1.2 Policy Landscape ..................................................................................................................... 32
  1.2.1 National landscape ............................................................................................................... 32
  1.2.2 NSW Health strategy and policy ......................................................................................... 33
1.3 Assumptions and Intentions of the Program .......................................................................... 36
  1.3.1 Focus on hospital avoidance ............................................................................................. 37
  1.3.2 Program Service Model .................................................................................................... 37
  1.3.3 Evidence based interventions: case management and self-management support .......... 38
  1.3.4 Targeting .......................................................................................................................... 40
  1.3.5 Customised models for local needs ................................................................................... 41
  1.3.6 Flexible funding arrangements ......................................................................................... 41
  1.3.7 Program funding and resource ......................................................................................... 41
1.4 This report ................................................................................................................................. 42
  1.4.1 Purpose of the report ......................................................................................................... 42

2 THE EVALUATION ...................................................................................................................... 44
2.1 Overview .................................................................................................................................. 44
  2.1.1 Mixed methods approach ............................................................................................... 44
  2.1.2 Program logic .................................................................................................................. 45
  2.1.3 Specific objectives of the Evaluation ............................................................................. 47
2.2 Data sources and methodology .............................................................................................. 47
  2.2.1 Process data collection ................................................................................................. 47
  2.2.2 Health service utilisation data collection ....................................................................... 48
  2.2.3 Data collection for evaluation of additional benefit to Aboriginal people .................... 49
2.3 Analysis ................................................................................................................................... 53
  2.3.1 Process evaluation ........................................................................................................... 53
  2.3.2 Evaluation of added benefit for Aboriginal people ......................................................... 54
  2.3.3 Service utilisation ........................................................................................................... 55
  2.3.4 Economic parameters .................................................................................................... 57
  2.3.5 Analysis methods .......................................................................................................... 57
3 FINDINGS ........................................................................................................... 61

3.1 Program development ....................................................................................... 61
  3.1.1 Core features of Program models ............................................................... 63
  3.1.2 Sub Analyses ............................................................................................. 78

3.2 Characteristics of CDMP models and implementation for Aboriginal people........ 88
  3.2.1 Overview – Key similarities and differences in approaches ......................... 89
  3.2.2 Case Study 1 – Hunter New England LHD .................................................. 90
  3.2.3 Case Study 2 – Western NSW LHD ........................................................... 96
  3.2.4 Case Study 3 – Western Sydney LHD ........................................................ 101
  3.2.5 Survey of Aboriginal Community Controlled Health Services in NSW ........ 108

3.3 Characteristics of CDMP participants ............................................................. 111
  3.3.1 The Evaluation cohort ............................................................................... 111
  3.3.2 Characteristics of CDMP participants – overall ......................................... 114
  3.3.3 Characteristics of Aboriginal participants in the CDMP ............................... 115
  3.3.4 Characteristics of CDMP participants who received external telephone coaching ........................................................................................................ 117

3.4 Health service utilisation ................................................................................. 118
  3.4.1 Overview of service utilisation of CDMP participants ............................... 118
  3.4.2 Natural history of mortality and service utilisation of the CDMP cohort and the Control cohort between 2007 and 2013 – unmatched analyses .............................................. 119
  3.4.3 Matched analyses ...................................................................................... 122
  3.4.4 The impact on service utilisation of receiving external telephone coaching .................................................................................................................. 140
  3.4.5 The benefit of CDMP participation for Aboriginal people ............................ 150
  3.4.6 LHD – specific outcomes ......................................................................... 162
  3.4.7 Predictors of outcome for CDMP Participants ........................................... 162

4 DISCUSSION ........................................................................................................ 165

4.1 Overview of key findings .................................................................................. 166
  4.1.1 Significant evolution of program approaches was evident at local levels. ................ 166
  4.1.2 Enrolment to the Program and its interventions predominantly occurred at times of peak acute service utilisation .......................................................... 167
  4.1.3 Participation in the CDMP was associated with increased unplanned and decreased planned acute service use ........................................................................ 168
  4.1.4 There was a dramatic decrease immediately following enrollment in both CDMP and Control patients .............................................................. 169
  4.1.5 The overall pattern of service use outcomes did not differ by LHD ................ 170
  4.1.6 Aboriginal participants in the CDMP were mainly identified through the acute sector at times of peak service utilisation, with an excess of post-enrolment utilisation compared to the control cohort .................. 170
  4.1.7 External telephone coaching did not appear to improve the outcomes of interest in the Evaluation 171

4.2 Limitations ........................................................................................................ 172

4.3 Implications of the findings for current policy environment ............................... 174

5 APPENDICES ...................................................................................................... 181

5.1 Findings of in-depth case studies of the process evaluation – Mid-term process report ... 181

5.2 Survey tools used in final scan ......................................................................... 206
  5.2.1 LHD survey tool ....................................................................................... 206
  5.2.2 ML survey tool ........................................................................................ 228

5.3 CDMP Minimum Data Set data variables included in the CDMP Outcomes Register .................................................. 238

Chronic Disease Management Program Evaluation – Final Report
5.4 Data variables included in the CDMP Outcomes Register ........................................ 239
5.5 Construction of composite variables for sub analysis .............................................. 242
5.6 Table of composite scores ......................................................................................... 246
5.7 Survey of Aboriginal Community Controlled Health Surveys in NSW .................. 247
5.8 Quality of matching ................................................................................................. 252
  5.8.1 Distribution of categorical characteristics after matching for Healthways cohorts ........................................ 252
  5.8.2 Distribution of continuous characteristics after matching for Healthways cohorts ........................................ 253
  5.8.3 Distribution of categorical characteristics after matching for Aboriginal cohorts ........................................ 254
  5.8.4 Distribution of continuous characteristics after matching for Aboriginal cohorts ........................................ 255
5.9 LHD specific outcomes ............................................................................................ 256
  5.9.1 Western Sydney LHD (X740) ........................................................................... 256
  5.9.2 South East Sydney (X720) .............................................................................. 259
  5.9.3 Illawarra Shoalhaven (X730) ......................................................................... 262
  5.9.4 Hunter New England (X800) .......................................................................... 265
  5.9.5 Central Coast (X770) ...................................................................................... 268
  5.9.6 Mid North Coast (X820) .................................................................................. 271
  5.9.7 Murrumbidgee (X840) .................................................................................... 274
  5.9.8 Nepean Blue Mountains (X750) ...................................................................... 277
  5.9.9 Northern NSW (X810) ................................................................................... 280
  5.9.10 Northern Sydney (X760) .............................................................................. 283
  5.9.11 South Western Sydney (X710) ...................................................................... 286
  5.9.12 Southern NSW (X830) .................................................................................. 289
  5.9.13 Sydney (X700) .............................................................................................. 292
  5.9.14 Western NSW (X850) ................................................................................... 295
  5.9.15 Far West (X860) ............................................................................................ 297
5.10 Identifying predictors of outcomes .......................................................................... 298

REFERENCES .................................................................................................................. 301
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABF</td>
<td>Activity-based funding</td>
</tr>
<tr>
<td>ACCHS</td>
<td>Aboriginal Community Controlled Health Service</td>
</tr>
<tr>
<td>AHS</td>
<td>Area Health Services</td>
</tr>
<tr>
<td>APDC</td>
<td>Admitted Patient Data Collection</td>
</tr>
<tr>
<td>ARGUS</td>
<td>A secure messaging system used by health care practitioners in NSW</td>
</tr>
<tr>
<td>AUID</td>
<td>Area Unique Identifier</td>
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<tr>
<td>AHW</td>
<td>Aboriginal Health Worker</td>
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<td>AHWs</td>
<td>Aboriginal Health Workers</td>
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<tr>
<td>CCSS Program</td>
<td>Care Coordination and Supplementary Services Program</td>
</tr>
<tr>
<td>CDMP</td>
<td>Chronic Disease Management Program</td>
</tr>
<tr>
<td>CDMP OR</td>
<td>Chronic Disease Management Program Outcomes Register</td>
</tr>
<tr>
<td>CHeReL</td>
<td>Centre for Health Record Linkage</td>
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<tr>
<td>CHIME</td>
<td>Community Health Information Management Enterprise</td>
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<tr>
<td>CTG</td>
<td>Closing the Gap</td>
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<td>EDDC</td>
<td>Emergency Department Data Collection</td>
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<td>GP</td>
<td>General Practice</td>
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<tr>
<td>GPs</td>
<td>General Practitioners</td>
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<tr>
<td>ICD10-AM</td>
<td>International Classification of Diseases version 10 – Australian modification</td>
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<tr>
<td>IPART</td>
<td>NSW Independent Pricing and Regulatory Tribunal</td>
</tr>
<tr>
<td>LHD</td>
<td>Local Health District</td>
</tr>
<tr>
<td>MDS</td>
<td>Minimum Data Set</td>
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<tr>
<td>ML</td>
<td>Medicare Local</td>
</tr>
<tr>
<td>NWAU</td>
<td>National weighted activity unit</td>
</tr>
<tr>
<td>RBDM</td>
<td>Register of Births, Deaths and Marriages</td>
</tr>
</tbody>
</table>
### List of Tables

| Table 1 | Chronic Disease Management Funding from 2009/10 - 2014/15 (with escalation funding) | 42 |
| Table 2 | ICD codes and additional selection information for potentially preventable hospitalisations: hospital admissions resulting from ambulatory care sensitive conditions | 55 |
| Table 3 | Summary of achievements and developments | 61 |
| Table 4 | Core features of chronic disease management programs | 63 |
| Table 5 | Approaches to improve access by vulnerable groups reported by LHDs | 78 |
| Table 6 | Groups of composite variables describing LHD programs | 87 |
| Table 7 | Age (at enrolment of Aboriginal CDMP participants in Hunter New England) | 91 |
| Table 8 | Gender of Aboriginal CDMP participants in Hunter New England | 91 |
| Table 9 | Number of health service providers and managers interviewed across Hunter New England separated by health service and Aboriginality | 92 |
| Table 10 | Stratification of CDMP clients in the Hunter New England LHD (separated into Hunter region and New England region) | 94 |
| Table 11 | Age (at enrolment) of Aboriginal CDMP participants in Western NSW | 96 |
| Table 12 | Gender of Aboriginal CDMP participants in Western NSW | 97 |
| Table 13 | Number of health service providers and managers interviewed across Western Sydney, separated by health service and Aboriginality | 97 |
| Table 14 | Age (at enrolment) of Aboriginal CDMP participants in Western Sydney | 102 |
| Table 15 | Gender of Aboriginal CDMP participants in Western Sydney | 102 |
| Table 16 | Number of health service providers and managers interviewed across Western Sydney LHD, separated by health service and Aboriginality | 103 |
| Table 17 | Stratification and review of Aboriginal clients | 105 |
| Table 18 | Role of person completing the Survey of Aboriginal Community Controlled Health Services | 109 |
| Table 19 | CDMP Evaluation cohort by LHD and year of enrolment | 113 |
| Table 20 | Demographic characteristics by year of enrolment for the CDMP Evaluation cohort (n=41,303) | 115 |
| Table 21 | Aboriginal CDMP participants flagged in the MDS and in the APDC | 116 |
| Table 22 | Aboriginal Evaluation cohort (n=2423 of 41,303) | 116 |
| Table 23 | Healthways cohort by LHD and year of enrolment into Healthways | 117 |
| Table 24 | Potential predictors of CDMP outcome: Interaction between key variables, and the difference between CDMP and control cohorts | 163 |
| Table 25 | Functional specifications to facilitate local development of the CDMP | 165 |
List of Figures

Figure 1  CDMP Operational Model* ................................................................. 37
Figure 2  Logic Model ........................................................................ 46
Figure 3  Overview of process evaluation data collection ................................. 48
Figure 4  Categories of program participants in the CDMP MDS for the purposes of Evaluation ................................................................. 51
Figure 5  Type of governance structure by LHD ............................................ 64
Figure 6  Groups represented on governance structure by LHD .......................... 64
Figure 7  ML & GP governance and GP engagement in CDMP by ML (ML survey) ...................................................................................... 65
Figure 8  Location of care coordinators by LHD ............................................ 65
Figure 9  Roles of LHD care coordinators by LHD ........................................ 66
Figure 10  Roles of ML-based care coordinators by ML (ML survey) ................. 66
Figure 11  Training in health coaching by LHD .............................................. 67
Figure 12  Systems for electronic sharing of information by LHD ..................... 68
Figure 13  Adequacy of LHD information systems by LHD .............................. 68
Figure 14  Systems for information sharing by ML (ML survey) ....................... 69
Figure 15  Intake arrangements by LHD ....................................................... 69
Figure 16  Roles of intake centres.................................................................. 70
Figure 17  Integration of intake with other intake arrangements by LHD ............ 70
Figure 18  Systems for monitoring patient progress and reach of the Program by LHD ...................................................................................... 71
Figure 19  Estimated proportion of eligible Aboriginal patients referred from 48 Hour Follow Up Program by LHD ...................................................... 71
Figure 20  Representation on CDMP governance structure by LHD .................. 72
Figure 21  Estimated proportion of care coordinators’ time spent on liaison with ACCHS by LHD ................................................................. 72
Figure 22  Systems for sharing information between LHD and ACCHS by LHD ...................................................................................... 72
Figure 23  Integration of CDMP intake arrangements with intake for the 48 Hour Follow Up Program by LHD ................................................. 73
Figure 24  ML coordination of care arrangements for Aboriginal patients by ML (ML survey) ................................................................. 73
Figure 25  Source of patient referrals to the CDMP by LHD ............................. 74
Figure 26  Approaches to comprehensive assessment by LHD ......................... 74
Figure 27  Groups undertaking comprehensive assessments by LHD ............... 75
Figure 28  Groups developing CDMP care coordination plans by LHD ............... 75
Figure 29  Groups involved in coordinating care by LHD ................................. 76
Figure 30  Groups who can access the CDMP care coordination plan by LHD ...................................................................................... 76
Figure 31  Patients receiving different levels of care by LHD ............................. 77
Figure 32  LHDs by geography ...................................................................... 80
Figure 33  LHDs by care coordinator location ................................................ 81
Figure 34  LHDs by intake arrangements ......................................................... 82
Figure 35  LHDs by type of governance structure ............................................ 83
Figure 36  LHDs by use of telephone support .................................................. 84
Figure 37  LHDs by orientation (high LHD orientation, high primary care orientation) ...................................................................................... 85
Figure 38  LHDs by proportion of referrals not from LHD hospitals .................. 86
Figure 39  The CDMP model of care for the Hunter New England LHD ................ 92
Figure 40  Western NSW Local Health District’s CDMP model .......................... 98
Figure 41  Western Sydney Local Health District’s CDMP model .......................... 103
Figure 42  CDMP Outcomes Register: Derivation of the Evaluation cohort ............ 111
Figure 43  Derivation of the CDMP cohort for matching purposes ...................... 112
Figure 44  CDMP Evaluation cohort Enrolments by year (n=41,303) .................... 112
Figure 45  Enrolments by LHD and year of enrolment for the CDMP Evaluation cohort (n=41,303) ................................................................. 113
Figure 46  Demographic characteristics of Evaluation cohort (n=41,303) ......... 114
Figure 47  Demographic characteristics of the Aboriginal Evaluation cohort (n=2423) ...................................................................................... 117
Figure 48  Demographic characteristics of the Healthways cohort .................... 118
Figure 49  Overview of service utilisation of the Evaluation cohort (n=41,303) in the year before enrolment .. 119
Figure 50  Monthly rate of deaths in the CDMP (orange) cohort (N= 41, 303) and control (grey) cohort (N = 526,876) between Jan 2007 and November 2013 ................................................................. 120
Figure 51  Monthly rate of potentially preventable hospitalisations in the CDMP (orange) cohort (N= 41,303) and control (grey) cohort (N= 526,876) ................................................................. 121
Figure 52  Monthly rate of Emergency Department presentations in the CDMP (orange) cohort and control (grey) cohort (N= 526,876) ...................................................................................... 121
Figure 53 Monthly rate of potentially preventable readmissions in the CDMP (orange) cohort (N= 41,303) and control (grey) cohort (N= 526,876) ................................................................. 122
Figure 54 All hospital admissions - unmatched – for the entire CDMP (orange) cohort (N= 41,303) and the control (grey) cohort (N= 526,876) .............................................................................. 123
Figure 55 All hospital admissions for the matched survivor CDMP (orange) cohort (N= 26,208) and control (grey) cohort (N=26,187). .................................................................................. 124
Figure 56 Potentially preventable admissions in the CDMP (orange) and Control (grey) cohorts after enrolment – before matching, after matching, and the modelled differences between the two matched cohorts .................................................................................... 125
Figure 57 Potentially preventable readmissions (unplanned admission followed by an potentially preventable readmission) in the CDMP (orange) and Control (grey) cohorts after enrolment - before matching, after matching, and modelled differences between the two matched cohorts ................................................................. 127
Figure 58 Emergency Department presentations in the CDMP (orange) cohort and the control (grey) cohort following enrolment - before and after matching, and modelled differences between the two matched cohorts ...................................................................................... 129
Figure 59 Potentially preventable bed days in the entire CDMP (orange) cohort and the control (grey) cohort following enrolment - before and after matching, and modelled differences between the two matched cohorts ...................................................................................... 130
Figure 60 Monthly average of all hospital admissions for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 132
Figure 61 Monthly average of unplanned admissions for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 133
Figure 62 Monthly average of potentially preventable admissions for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 134
Figure 63 Monthly average of potentially preventable bed-days for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 135
Figure 64 Monthly average of emergency department presentations for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 136
Figure 65 Distribution of categorical characteristics after matching ................................................................. 137
Figure 66 Distribution of continuous characteristics after matching ................................................................. 138
Figure 67 Matched analysis of death for members of the CDMP (orange) and Control (grey) cohorts before and after enrolment (number of cohort members across time shown under the X axis) .......... 139
Figure 68 Modelled difference in the rate of death in the matched CDMP (orange) and Control (grey) cohorts for each month of enrolment ................................................................. 140
Figure 69 Potentially preventable hospitalisation admissions in the CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N=1,088), and adjusted differences between the two matched cohorts ...................................................................................... 141
Figure 70 Potentially preventable readmissions in CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N= 1088), and adjusted differences between the two matched cohorts ...................................................................................... 142
Figure 71 Emergency Department presentations in the CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N= 1168) and adjusted differences between the two matched cohorts ...................................................................................... 143
Figure 72 Potentially preventable bed days in the CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N= 1168) and adjusted differences between the two matched cohorts ...................................................................................... 144
Figure 73 Monthly average of potentially preventable admissions for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 145
Figure 74 Monthly average of potentially preventable readmissions (following any unplanned admission) for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................ 146
Figure 75 Monthly average of Emergency Department presentations for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ................................................................. 147

Figure 76 Monthly average of potentially preventable bed days for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ......................................................................... 148

Figure 77 Matched analysis of proportion of death for members of the Healthways (maroon) and Control (grey) cohorts before and after enrolment, and modelled differences between the two cohorts, with time zero indicating time of enrolment in Healthways (number of cohort members across time shown under the X axis) ................................................................................................................................. 149

Figure 78 Potentially preventable admissions in the matched CDMP Aboriginal cohort (orange) and Control Aboriginal cohort (grey) cohort (N= 1838) by semester of enrolment .......................................................................................................................... 151

Figure 79 Potentially preventable readmissions for matched CDMP Aboriginal cohort (orange) and Control cohort (grey) cohort (N= 1838) by semester of enrolment .......................................................................................................................... 152

Figure 80 Potentially preventable bed-days for matched CDMP Aboriginal cohort (orange) and Control cohort (grey) cohort (N= 1838) by semester of enrolment .......................................................................................................................... 153

Figure 81 Emergency Department presentations for matched CDMP Aboriginal cohort (orange) and Control cohort (grey) cohort (N= 1838), by semester of enrolment .......................................................................................................................... 154

Figure 82 a) b) c) d) Modelled differences in potentially preventable admissions, potentially preventable re-admissions, Emergency Department presentations, and potentially preventable bed-days between the matched CDMP Aboriginal and Control Aboriginal cohorts .................................................................................. 155

Figure 83 Monthly average of potentially preventable admissions for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ......................................................................... 157

Figure 84 Monthly average of potentially preventable re-admissions for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ......................................................................... 158

Figure 85 Monthly average of potentially preventable bed-days for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ......................................................................... 159

Figure 86 Monthly average of Emergency Department presentations for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point) ......................................................................... 160

Figure 87 Proportion of death pre and post enrolment in the matched Aboriginal CDMP (orange) and control Aboriginal (grey) cohorts with time zero indicating time of enrolment (numbers below the X axis indicate patient numbers in each cohort at each time point) Matched analysis of proportion of death for members of the Healthways .......................................................................................................................... 161

Figure 88 Regression to the mean in the absence of intervention, reproduced from Steventon et al .......................... 169

Figure 89 Monthly rate of Potentially Preventable Hospitalisation before and after enrolment for CDMP participants matched to a control case and those not able to be matched to a control case .............................................................................. 174

Figure 90 The model of proportionate universalism ........................................................................................................ 179

Figure 91 Utilisation rates for the matched Western Sydney LHD CDMP and Control cohorts .................................. 256

Figure 92 Adjusted differences (Western Sydney LHD) .................................................................................................. 257

Figure 93 Average potentially preventable hospitalisation pre and post enrolment for the matched Western Sydney LHD CDMP and Control Cohorts .................................................................................................................. 258

Figure 94 Utilisation rates for the matched South Eastern Sydney LHD CDMP and Control cohorts .................. 259

Figure 95 Adjusted differences (South Eastern Sydney LHD) .......................................................................................... 260

Figure 96 Average potentially preventable hospitalisation pre and post enrolment for the matched South Eastern Sydney LHD CDMP and Control Cohorts .................................................................................................................. 261

Figure 97 Utilisation rates for the matched Illawarra Shoalhaven LHD CDMP and Control cohorts ................ 262

Figure 98 Adjusted differences (Illawarra Shoalhaven LHD) .......................................................................................... 263

Figure 99 Average potentially preventable hospitalisation pre and post enrolment for the matched Illawwarrah Shoalhaven LHD CDMP and Control Cohorts .................................................................................................................. 264

Figure 100 Utilisation rates for the matched Hunter New England LHD CDMP and Control cohorts ................ 265

Figure 101 Adjusted differences (Hunter New England LHD) .......................................................................................... 266

Figure 102 Average potentially preventable hospitalisation pre and post enrolment for the matched Hunter New England LHD CDMP and Control Cohorts .................................................................................................................. 267

Figure 103 Utilisation rates for the matched Central Coast LHD CDMP and Control cohorts ............................ 268

Figure 104 Adjusted differences (Central Coast LHD) .................................................................................................. 269
Figure 105 Average potentially preventable hospitalisation pre and post enrolment for the matched Central Coast LHD CDMP and Control Cohorts ................................................................. 270
Figure 106 Utilisation rates for the matched Mid North Coast LHD CDMP and Control cohorts ......................................................... 271
Figure 107 Adjusted differences (Mid North Coast LHD) ......................................................................................................................... 272
Figure 108 Average potentially preventable hospitalisation pre and post enrolment for the matched Mid North Coast LHD CDMP and Control Cohorts ................................................................. 273
Figure 109 Utilisation rates for the matched Murrumbidgee LHD CDMP and Control cohorts ......................................................... 274
Figure 110 Adjusted differences (Murrumbidgee LHD) ......................................................................................................................... 275
Figure 111 Average potentially preventable hospitalisation pre and post enrolment for the matched Murrumbidgee LHD CDMP and Control Cohorts ................................................................. 276
Figure 112 Utilisation rates for the matched Nepean Blue Mountains LHD CDMP and Control cohorts ......................................................... 277
Figure 113 Adjusted differences (Nepean Blue Mountains LHD) ......................................................................................................................... 278
Figure 114 Average potentially preventable hospitalisation pre and post enrolment for the matched Nepean Blue Mountains LHD CDMP and Control Cohorts ................................................................. 279
Figure 115 Utilisation rates for the matched Northern NSW LHD CDMP and Control cohort ......................................................... 280
Figure 116 Adjusted differences (Northern NSW LHD) ......................................................................................................................... 281
Figure 117 Average potentially preventable hospitalisation pre and post enrolment for the matched Northern NSW LHD CDMP and Control Cohorts ................................................................. 282
Figure 118 Utilisation rates for the matched Northern Sydney LHD CDMP and Comparison cohort ......................................................... 283
Figure 119 Adjusted differences (Northern Sydney LHD) ......................................................................................................................... 284
Figure 120 Average potentially preventable hospitalisation pre and post enrolment for the matched Northern Sydney LHD CDMP and Control Cohorts ................................................................. 285
Figure 121 Utilisation rates for the matched South Western Sydney LHD CDMP and Control cohorts ......................................................... 286
Figure 122 Adjusted differences (South Western Sydney LHD) ......................................................................................................................... 287
Figure 123 Average potentially preventable hospitalisation pre and post enrolment for the matched South Western Sydney LHD CDMP and Control Cohorts ................................................................. 288
Figure 124 Utilisation rates for the matched Southern NSW LHD CDMP and Control cohorts ......................................................... 289
Figure 125 Adjusted differences (Southern NSW LHD) ......................................................................................................................... 290
Figure 126 Average potentially preventable hospitalisation pre and post enrolment for the matched Southern NSW LHD CDMP and Control Cohorts ................................................................. 291
Figure 127 Utilisation rates for the matched Sydney LHD CDMP and Comparison cohorts ......................................................... 292
Figure 128 Adjusted differences (Sydney LHD) ......................................................................................................................... 293
Figure 129 Average potentially preventable hospitalisation pre and post enrolment for the matched Sydney LHD CDMP and Control Cohorts ................................................................. 294
Figure 130 Utilisation rates for the matched Western NSW LHD CDMP and Control cohorts ......................................................... 295
Figure 131 Adjusted differences (Western NSW LHD) ......................................................................................................................... 296
Figure 131 Average potentially preventable hospitalisation pre and post enrolment for the matched Western NSW LHD CDMP and Control Cohorts ................................................................. 297
Executive Summary

Table of Contents

Background .............................................................................................................................................. 13

The Chronic Disease Management Program ......................................................................................14

The Chronic Disease Management Program Evaluation ................................................................. 15

- Process Evaluation
- Evaluation of CDMP for Aboriginal people
- Quantitative Evaluation

Key findings ...........................................................................................................................................18

- Program development between 2012 and 2014
- Emerging typologies of programs
- Characteristics of CDMP models and implementation for Aboriginal people
- Characteristics of CDMP participants
- Health service utilisation

Key messages and implications of the Evaluation ..............................................................................23

- Significant evolution of Program approaches was evident at local levels
- Enrolment to the program and its interventions predominantly occurred at times of peak acute service utilisation
- Participation in the CDMP was associated with increased unplanned and decreased planned acute service use
- There was a dramatic decrease immediately following enrollment in both CDMP and Control patients
- The overall pattern of service use outcomes did not differ by LHD
- Aboriginal participants in the CDMP were mainly identified through the acute sector, around a time of peak acute service utilisation, with post-enrolment utilisation remaining higher than the Aboriginal Control cohort
- External telephone coaching did not appear to improve the outcomes of interest in the Evaluation

Implications of the findings for current policy environment ............................................................26

- The value of commitment to robust monitoring and evaluation
- Lessons for evaluations for future programs
- The need for support for systematic development of chronic care across existing systems
- The need for support for local development
- Harnessing the potential of extending into primary care

Background

In Australia, chronic disease contributes to more than 70% of the disease burden - a figure expected to increase to 80% by 2020. Not only is the burden of disease attributable to chronic diseases high and predicted to increase, but associated health care costs are rising rapidly: chronic non-communicable diseases account for 70% of health expenditure. Accordingly, a central focus of health reform over the last 2 to 3 decades in all jurisdictions in Australia has been the care and management of individuals living with chronic disease: some reforms have focused on health financing and others have aimed to improve coordination of care by making changes to the governance of the health system at the local level. These reforms are significant, they are ongoing and they set the scene for the development of the NSW Chronic Disease Management Program (CDMP).

The CDMP emerged as a core part of the reform agenda in NSW, building on the NSW Government’s investment in programs and strategies to manage chronic disease. Developments in the NSW State health
agenda aligned with the overarching national health reform movement for chronic disease management. In 2008, NSW Health formulated a business case for investment in developing approaches to harness the continuum of care to better manage individuals living with chronic disease in the state. The CDMP is a flagship initiative of the NSW Government for people with chronic condition(s) who are at risk of unplanned hospital stays and/or Emergency Department visits.

The Program has a significant funding commitment: funding at Local Health District (LHD) level commenced in the Financial Year 2009-2010, with total funding of approximately $200 million over 6 years from commencement through to 2015.

The independent Evaluation of the Program was commissioned in early 2011. The final report provides the results of the Evaluation of the CDMP up until May 2014.

The Chronic Disease Management Program

The CDMP is an LHD-based program targeting potentially avoidable acute service use. Ultimately, the Program aims to better connect the care and support of people with chronic diseases who have been hospitalised or are at risk of potentially preventable and unplanned hospitalisation due to their chronic diseases. The Program recognises that hospital admissions related to chronic disease are often preventable if care in the community is provided. Furthermore, many people have multi-morbid conditions with complex care needs that are frequently exacerbated by social and economic circumstances. With older people and those with chronic disease utilising a significant proportion of health services in NSW and accounting for almost half of total acute inpatient bed days a new model of coordinated, joined-up and shared care was mandated.

Specifically, the Program aims to deliver a suite of interventions to better integrate care to people within the community, to improve management of health conditions and to reduce reliance on acute care services reflected in potentially preventable hospitalisations. Providing care coordination and self-management support such as health coaching are expected to empower patients to better understand and manage their conditions, improving patient outcomes and supporting more efficient use of healthcare resources in NSW.

As a discrete sub-component, some local programs referred CDMP participants to external telephone coaching support provided by Healthways Australia. Healthways provides Telephone Health Coaching Services to eligible NSW Health patients as part of the NSW CDMP in three LHDs – South Eastern Sydney LHD, Illawarra Shoalhaven LHD and Hunter New England LHD. The telephone health coaching provided by Healthways lasts for 6 months and for this period registered nurses provide personalised health coaching that promotes patient responsibility and focuses on what an individual can actively do to improve their own wellbeing. The Healthways health coaches target lifestyle factors that may be inhibiting the wellbeing of the individual like exercise, nutrition, stress, smoking and medication adherence.

There are 6 elements to the Operational Model of the CDMP which are shown below:

The CDMP Operational Model*

*source: NSW Chronic Disease Management Program – Connecting Care in the Community (Service Model 2013)

A key component of the CDMP since inception has been targeted enrolment. In general, the Program aims to target people with the chronic diseases that result in the most frequent presentations to hospitals, drive the
highest health care costs, and respond best to improved care coordination and self-management support, namely:

- Diabetes
- Congestive Heart Failure
- Coronary Artery Disease
- Chronic Obstructive Pulmonary Disease, and
- Hypertension

Systems for identifying and enrolling patients are central to the process of targeted enrolment. Once patients are identified and enrolled to the Program a comprehensive assessment process is completed and patients assigned to the appropriate intervention. Monitoring and review of the patient cohort enrolled to the Program is seen to be an important component of a program designed to improve the care and management and health outcomes of individuals living with long-term conditions.

The Chronic Disease Management Program Evaluation

Overview

The primary objectives of the Evaluation of the CDMP were to measure the impact, reach, equity and costs of the Program, considering:

- **Impact**: Number of bed days arising from unplanned and/or potentially preventable hospital admissions, compared with usual care
- **Reach & equity**: The extent to which the distribution of program reach and outcomes reflects the needs of the populations served
- **Costs**: The measurement and valuation of the economic costs and benefits of the CDMP

A mixed methods approach, with three parallel lines of investigation, formed the basis of the Evaluation. The focus, data sources and analysis of each of these is described below.

Process Evaluation

Focus

The major focus of the process evaluation was to describe the implementation of the Program, describe perceptions of the strengths, weaknesses and achievements of programs, to identify differences that might be associated with differences in outcomes and to derive lessons.

The process evaluation aimed to:

- Describe the way in which the Program has been implemented at local level
- Describe staff views of the strengths, weaknesses and achievements of their program
- Identify differences in the way the Program has been implemented which may explain differences in reach, effectiveness, costs or benefits, patient or provider satisfaction, including any variations from the prescribed Program
- Derive lessons which may be relevant to similar programs or initiatives

Data sources

The data to inform the process evaluation were collected directly by the Evaluation Team. There were 3 tranches of data collection: an initial (late 2011/early 2012) high level scan of all LHD programs, mid-term (early 2013) in depth case studies of seven programs (4 metropolitan and 3 rural LHDs), and a final (early 2014) high level scan. Each stage was informed by the previous data collection. In this way the evolution of the Program, as well as its features at any point in time were available for analysis. The selection of the case studies was informed by explicit criteria and stakeholder consultations to ensure they included a range of models and
different contexts. Data collection methods included a mix of semi-structured interviews with a range of staff within the LHD, Medicare Locals, and other services providers including GPs. Program managers completed a survey and were interviewed as part of the two high level scans.

Analysis

The process evaluation component of the Evaluation describes program development from 2011 to 2014 including the core features of program models as at early 2014. A mix of content and thematic analysis was undertaken for the qualitative data. Differences between selected subgroups of program models were identified, based on a number of different features including geographical location, location of care coordinators, centralisation within the LHD and governance structure. Combinations of these features were considered, to identify whether particular typologies existed.

Evaluation of CDMP for Aboriginal people

Focus

Tailored approaches of the two main streams of investigation were used to evaluate added value to Aboriginal people in NSW. The focus of this component of the Evaluation was on the contribution of the Program to the development of more integrated and coordinated chronic disease care for Aboriginal people (at risk of potentially preventable hospitalisation). This component also explored the extent to which the CDMP intersects with other key programs providing care and management to Aboriginal people living with chronic disease in NSW.

Data sources

Data concerning CDMP models and implementation for Aboriginal people were obtained from a range of purpose specific data sources.

The process evaluation of the Aboriginal component of the Evaluation built on the process evaluation component of the broader State-wide CDMP Evaluation, with data collection occurring in late 2013/early 2014:

- In-depth qualitative case studies of three LHD programs
- Interviews of a small number of patients on the CDMP
- A survey with Aboriginal Community Controlled Health Services in NSW

The Evaluation Team sought advice from key stakeholders regarding case study sites—from the ACI, the Ministry of Health, and from members of the Evaluation Steering Group and other collaborators within the Evaluation Team. The criteria for selection of case study sites were as follows:

- LHDs with a well-developed and functioning CDMP
- LHDs providing complete and good quality quantitative data to the evaluation
- LHDs located across a range of metropolitan, regional and remote locations,
- LHDs with a large Aboriginal population

LHDs and Medicare Locals (MLs) were also surveyed about their engagement in and process for enrolment and care for Aboriginal CDMP participants.

Health service utilisation data were available in the CDMP Outcomes Register (CDMP OR), using the Aboriginal and Torres Strait Islander identifier in these data.

Analysis

The Aboriginal evaluation component of the Evaluation overviewed the characteristics of CDMP models and implementation for Aboriginal people, using a mix of content and thematic analysis. A key focus of the analysis was the intersection of the Program with other programs (and service providers) providing care to Aboriginal people living with chronic disease.

The health service utilisation aspect of this component of the Evaluation was as described below.
**Quantitative Evaluation**

**Focus**

The quantitative evaluation aimed to:

- Describe patterns of service utilisation
- Assess the costs of service utilisation
- Identify the impact of program participation on utilisation and associated costs
- Consider the influence of local models on the impact of program participation

**Data sources**

The Minimum Data Set (MDS) created the central collection of data on people enrolled on the NSW CDMP to make it possible to track Program roll out and the characteristics of the participants. The primary source of health service utilisation data for the Evaluation was the CDMP OR. The CDMP OR was established in late 2013 under the Public Health and Disease Registers provisions of the Public Health Act to facilitate the measurement and monitoring of outcomes of the CDMP. It is the mechanism through which the Evaluation Team accessed a linked dataset for the Evaluation (for both CDMP participants registered on the MDS provided by LHDs and for the comparison group of individuals (that is, persons eligible for but not on the Program, having been hospitalised for one of the five CDMP target conditions during the time period of interest). The Register contains linked individual records from the following sources:

i) all records of the NSW CDMP held by NSW Health and Medicare Locals (ML);

ii) all records of participants on the Healthways coaching program, held by Healthways Australia;

iii) records of the NSW Admitted Patient Data Collection (public hospitals) and NSW Private Hospital Inpatient Statistics Collection, held by the Ministry of Health, for the period 1 January 2007 onwards that link to (i) or (ii) and all records relating to the following conditions:
   - Chronic Obstructive Pulmonary Disease
   - Coronary Artery Disease
   - Hypertensive Diseases
   - Congestive Heart Failure
   - Diabetes

iv) records of the NSW Emergency Department Data Collection, held by the Ministry of Health, for the period 1 January 2007 onwards that link to (i) or (ii);

v) NSW Registry of Births, Deaths and Marriages Death Registrations, held by the Registry of Births, Deaths and Marriages and the Ministry of Health, for the period 1 January 2007 onwards that link to (i) or (ii);

vi) all variables in the data collections listed in (i) – (v) excluding identifying particulars.

**Analysis**

Program participants enrolled to the Program and registered on the MDS from January 2011 to the end of the 2013 form the CDMP Evaluation cohort. The primary analysis set consisted of all CDMP patients enrolled between January 2011 (Month 1) and December 2013 (Month 35). Multivariate and matched analyses were further restricted to the “Multivariate cohort” defined as those enrolled between January 2011 (Month 1) and November 2013 (Month 35) and who had at least one hospital admission or ED presentation in the 12 months preceding their enrolment into the Program. For each month between Month 1 and Month 35, any person never enrolled in CDMP and who had had at least one hospital admission or ED presentation in the 12 months preceding the month was considered a potential control.
We constructed a matched control group, at person level, by deriving a propensity score for the CDMP Evaluation cohort and the available (never enrolled) comparison cases in the CDMP OR. This score summarises as a single figure those characteristics that reflect the likelihood that a given person would be enrolled in the CDMP, based on their baseline characteristics.

Baseline characteristics were obtained using the data collected at the time of hospitalisations and Emergency Department presentations occurring in the last 12 months. Characteristics included socio-demographic characteristics collected at the time of the most recent hospitalisation and a set of variables summarising medical history and service utilisation in the 12 months preceding enrolment.

Each CDMP patient in the Evaluation cohort was matched to one control case in the CDMP OR using 1:1 matching based on the propensity score. The matching procedure essentially simulates a randomised control trial.

Beyond all hospitalisations, the analysis focused on four key outcomes: potentially preventable hospitalisations, potentially preventable readmissions (unplanned admission followed by an potentially preventable readmission), potentially preventable bed-days, and Emergency Department presentations. Analysis of mortality rates of the CDMP Evaluation cohort (and the matched Control cohort) was also completed.

Further to these analyses, sub-group analyses were completed for Aboriginal CDMP participants, CDMP participants who received external telephone coaching from Healthways, and by LHD. Appropriated matched Control cohorts were constructed for these analyses.

The National Weighted Average Unit data needed to assess the costs of service utilisation were largely incomplete at the time of analysis and reporting; therefore this aspect of the quantitative evaluation was not undertaken.

Key Findings

Program development between 2012 and 2014

All LHDs developed programs that evolved over time and were well established by the end of the Evaluation. They varied according to local need, but all covered the core components of recruitment, assessment, care planning, care coordination and (in many cases) telephone support. Significant evolution of the Program was evident over time.

- **Identifying, managing and tracking enrolments:** The Program relied on information and communication systems for identifying and recruiting people, sharing information and monitoring the program; existing systems were generally not up to the task, hindering program development and integration between services and sectors. At the start of the Program, the focus was on enrolment of patients to meet targets, and most commonly from hospital admissions. Over time, more consistent approaches to intake and comprehensive assessment were adopted, and some systems for monitoring progress and reach at a program level were established.

- **Developments of Systems:** Developments in the Program were supported by improvements in systems supporting the Program for example establishing single points of contact, strengthening systems for sharing information, and standardising tools for assessment. At the final scan, nearly all LHDs had either a single or multiple intake centres/points. All LHDs also had systems in place for sharing information across the LHD, although commonly the functionality was partial only, particularly for sharing information with general practitioners (GPs).

- **Integration with other chronic disease management programs/services:** The pre-existence of other services/programs providing care and management for patients with chronic disease sometimes made it difficult to negotiate the particular role of the CDMP. Links with other programs – for example existing rehabilitation programs – were strengthened over time and models of care became more comprehensive. By 2014, intake arrangements in nearly all LHDs for the Program were fully or partly integrated with those for community health services. Integrated arrangements for the 48 Hour Follow Up Program were common, but those for aged care community health services less common.
• **Governance structures**: In the majority of LHDs, governance for the program was integrated with other chronic disease governance structures and a broad range of groups were represented on the governance structures for the program with the Aboriginal Community Controlled Health Service (ACCHS) Sector and consumers the least represented groups.

• **Model of care**: The initial focus of the Program in most LHDs was on provision of care coordination. Over time significant progress was evident in implementation of health coaching and differentiation of levels of care coordination based on need. By 2014, there were exemplars of well-established arrangements for providing telephone support for at least 50% of enrolled patients.

• **Engagement with other providers**: Engagement with general practice (GP) remained low; this was also true of engagement with the ACCHS sector. It was relatively rare for comprehensive assessments or care plans to be undertaken by primary care staff. Engagement with MLs on the other hand was stronger. Most referrals to the program came from LHD hospitals; there were few referrals from other sources including GPs or rehabilitation programs.

• **Location and role of care coordinators**: Location of care co-ordinators varied: most commonly they were based exclusively in LHDs or in both LHDs and MLs. Only one program had coordinators based solely in MLs. It was much more common for LHD-based care coordinators to coordinate the care of most patients, than ML-based Care coordinators. Patient navigation, phone support, and health coaching were the more common roles for care co-ordinators, with only a minor role in clinician support and GP liaison.

• **Health coaching training**: Almost all care coordinators had received training in health coaching, with such training less common for other health staff. Health coaching training was reported to be popular with staff: where staff outside of the LHD were trained (e.g. ML, GP) this was perceived as a value-add coming from the CDMP.

**Emerging typologies of programs**

Emerging program typologies could be described by features which were contextual, which reflected aspects of the design or which reflected the operation of the LHD program.

• **Context – metropolitan vs rural and remote - influenced Program design**: Metropolitan programs were more likely to have integrated governance and a single intake centre, more adequate information system links with primary care and a greater primary health care orientation, where rural and remote programs tended to locate their care coordinators in the LHD only, had a stronger LHD orientation and made greater use of telephone support. This may reflect more systematic approaches and capable systems within metropolitan areas where services are more dense; and less capacity to move outside the LHD in rural areas, where services are more devolved and have less complex infrastructure, and primary care services may be more stretched.

• **There were two broad groupings in terms of design**: Where care coordinators were based in the LHD only, this tended to be part of a an integrated LHD approach within the LHD, with integrated governance, a single intake system, higher use of tools for program review and stronger LHD orientation. Where care coordinators were in both locations, information systems tended to be stronger, perhaps to cope with a more decentralised program, and a higher primary care orientation. This shows the importance of this foundational element of program design.

• **There were also associations between design and program operation**: Referrals to the program from LHD hospitals tended to be higher where there was integrated governance, high information system capacity, high integration of intake arrangements with other programs, and high use of tools for program review. This suggests that where the program was more systematic and integrated with other parts of the LHD, this facilitated referrals to meet enrolment targets. This referral pathway may have been more immediately appealing to hospitals, which lack other options compared to, for instance, rehabilitation programs which may have already been offering related services. By contrast, a higher proportion of enrolments came from elsewhere in the LHD (but not from primary care) where there was stand-alone governance and other intake arrangements, and care coordinators were in the LHD only – perhaps giving them a greater need to engage with other LHD services and facilitate their referrals.
Characteristics of CDMP models and implementation for Aboriginal people

- **Referral Pathway**: The main referral pathway for Aboriginal people into the Program was through the acute care sector - made either by the LHD CDMP Care Coordinator or the 48 Hour Follow-Up worker; referrals of Aboriginal people into the Program from GP (including ACCHSs) were uncommon.

- **Engagement with other services and providers**: Programs developed strong working relationships with their MLs. MLs played an important role in care coordination of Aboriginal clients either through support of GP to develop shared care plans or in the provision of care coordination directly to clients. In contrast, ACCHSs appear to have limited visibility in the delivery to care to Aboriginal clients on the CDMP to date.

- **Location and role of care coordinators**: Both LHD-based care coordinators and ML-based care coordinators reported liaising with ACCHSs. However, in general ML-based care coordinators reported spending a lower proportion of time liaising with ACCHS than their LHD-based counterparts.

- **Systems for sharing information**: While systems for sharing information across the LHD improved over time, the systems were less well developed for sharing of information between the LHD and GPs or MLs. The systems least well developed were those for sharing information between the LHD and the ACCHS sector.

- **Integration of chronic disease care and management**: Integration with other programs, services and sectors improved over time, but remained variable, and was only consistent for the 48 Hour Follow Up Program and the Care Coordination and Supplementary Services Program. Although integration with the Aboriginal Community Controlled Health Service (ACCHS) sector remained minimal, development of integration was supported through representation on governance structures. By 2014, the majority of LHDs had Aboriginal health represented on their governance structure and one third had ACCHS representation on their governance structure.

Characteristics of CDMP participants

The quantitative evaluation characterised all CDMP participants - including key sub-groups of Aboriginal participants on the Program and CDMP participants who received Healthways telephone coaching - and examined patterns of health service utilisation of these cohorts (and matched control cohorts).

**The CDMP Evaluation cohort:**

- In all, 41,303 participants were part of the Evaluation cohort.
- Enrolments, based on the MDS, over the Evaluation period (2011 – 2013) peaked in 2012, with the lowest enrolment levels by a small margin in 2013.
- The size of the Evaluation cohort in each LHD varied considerably – with variations in line with expected enrolments across NSW – but for all LHDs the majority of enrolments occurred after January 2012.
- The demographic characteristics of the CDMP Evaluation Cohort remained reasonably stable over the evaluation period showing:
  - The cohort was evenly split by sex
  - The cohort was largely older participants, with nearly half of participants >= 75 years of age
  - Approximately 5% of participants were reported as Aboriginal, in line with enrolment targets set for the Program
  - The vast majority of participants came from major cities, although most ARIA classifications were represented in the cohort
  - Participants could most commonly be classified as moderately disadvantaged on the SEIFA disadvantage scale, with approximately one quarter classified as being in the 3 most disadvantaged deciles.

**The CDMP Aboriginal Evaluation Cohort:**

- The CDMP Aboriginal Evaluation cohort included 2,423 individuals (as reported in the APDC/EDDC data).
- The Aboriginal Evaluation cohort had the following demographic characteristics:
  - Younger than the overall cohort, most commonly 50 - 65 years of age
  - Most commonly classified as being in the most disadvantaged SEIFA categories.
The Healthways Evaluation cohort:

- The cohort comprised 1,529 CDMP participants who were enrolled in Healthways during the evaluation period and were flagged in the CDMP OR.
- Inspection of the demographic characteristics of the sub-group of participants who received the six-month Healthways telephone coaching intervention revealed some key similarities and differences in this sub-group, compared with the whole CDMP cohort:
  - A younger cohort than the CDMP cohort overall, with the majority of participants < 65 years of age.
  - Like the overall cohort, Healthways participants were most commonly classified in the moderately disadvantaged categories of the SEIFA disadvantage scale.
  - Like the overall cohort, Healthways participants were equally split by sex.
  - Like the overall cohort, approximately 5% of Healthways participants were Aboriginal (as reported in the APDC/EDDC data).

Health service utilisation

Overall cohort health service utilisation patterns of the CDMP Evaluation cohort

- The CDMP participants in the Evaluation cohort were frequent users of acute services. In the year prior to enrolment, nearly half of CDMP participants had multiple admissions, multiple potentially preventable admissions and multiple Emergency Department presentations.
- The pattern of mortality in the CDMP Evaluation cohort was very similar to that of the Control cohort – both before and after matching - suggesting that that the CDMP cohort was not comprised of patients closer to death than the Control cohort.
- The CDMP cohort shows a consistent excess in average yearly rate of potentially preventable admissions compared to the Control cohort.
- The yearly rate of potentially preventable hospital episodes appears to increase gradually for both CDMP and Control cohorts over time.
- The same pattern of findings can be seen for potentially preventable readmissions (unplanned admission followed by an potentially preventable readmission), emergency department presentations, and potentially preventable bed days.
- Analysis of the key evaluation outcomes measures (unplanned hospitalisations, potentially preventable admissions, potentially preventable re-admissions, potentially preventable bed days and emergency department presentations) for each month before and after enrolment (over the period 2007 – 2013) show that:
  - Prior to their enrolment in the Program, the monthly rate and pattern of utilisation for CDMP patients was virtually identical to that of the Control group patients.
  - The monthly rate of utilisation for both groups increased steadily in the years prior to enrolment, until the year before enrolment, when the monthly rate of admissions increased sharply for both groups.
  - Enrolment occurred at the peak of utilisation in the pre-enrolment period (4 to 7 years) for which data were available.
  - Utilisation declined sharply immediately following enrolment for both groups, and then continued to decrease more gradually over the post enrolment period.
  - Post enrolment, utilisation remained consistently higher for CDMP participants compared to the Control participants.

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1 Please see Section 3.4.4 for consideration of the issues associated with identification of CDMP participants also receiving the Healthways intervention.
Health service utilisation patterns of the CDMP Evaluation cohort receiving Healthways coaching

- Health service utilisation of the CDMP cohort receiving Healthways telephone coaching was significantly higher post-enrolment in Healthways, when compared to Control participants not enrolled in the CDMP.
- The differences in utilisation between the CDMP Healthways cohort and the Control group were smaller than the ones obtained when comparing the entire CDMP cohort to their matched controls.
- Sensitivity analyses, where Healthways participants were matched to other CDMP participants, supported this finding by showing reduced excess (compared to the Control cohort) in service utilisation in those receiving Healthways telephone coaching.
- Longitudinally – before and after enrolment - there appeared to be no clear differences in the rate and pattern of service utilisation between the two groups. The overall pattern for Healthways cohort and the Control cohort over time appeared to be very similar to that already described for the cohort overall, namely commencement of the intervention around a utilisation peak, which was followed by an immediate sharp decline in service use, and then a more steady decline over time.

Health service utilisation patterns of the CDMP Aboriginal Evaluation cohort

- The CDMP Aboriginal cohort showed a consistent excess in yearly rate of potentially preventable admissions, potentially preventable readmissions and potentially preventable bed days, compared to the Control Aboriginal cohort.
- The pattern for these outcomes also appears to be similar for both cohorts: the rate of potentially preventable admissions, readmissions and potentially preventable bed days appears to increase gradually in those enrolled/matched more recently.
- There were no differences between the cohorts in yearly rate of emergency department presentations and for both groups the rate appeared to remain flat over time.
- Longitudinally – pre and post enrolment - the monthly rate of potentially preventable admissions, readmissions and potentially preventable bed days for both the CDMP Aboriginal Cohort and the Control Aboriginal cohort was similar:
  - Utilisation increased steadily in the years prior to enrolment, until the year before enrolment, when the monthly rate of admissions increased sharply.
  - Enrolment occurred at the peak of utilisation in the pre-enrolment period for which data were available (4 to 7 years before enrolment).
  - Admissions declined sharply immediately following enrolment for both groups, and then gradually over the post enrolment period.
  - Post enrolment, the rate of potentially preventable admissions, readmissions and potentially preventable bed days remained consistently higher in the CDMP Aboriginal cohort compared to the Control cohort.
- Emergency Department presentations showed the same overall pattern over time as other outcome measures for both cohorts; however the rate of Emergency Department presentations was virtually identical for both groups throughout. The higher rate of Emergency Department attendances by Aboriginal people overall, when compared to non-Aboriginal people, is well-documented and was confirmed in the present data. Lack of comprehensive diagnostic data for Emergency Department presentations prevents further exploration of the drivers of Emergency Department presentations which may be common to both control and CDMP participants, resulting in the two groups having a similar pattern and rate.
- There were no significant differences between the CDMP Aboriginal and Control Aboriginal cohorts in mortality rates.

Outcomes by LHD

- Overall, the vast majority of the findings at the LHD level parallel those already reported for the entire cohort. Specifically, the overwhelming finding was enrolment of patients at the peak of utilisation of the evaluation period. The pattern of utilisation was then identical for the CDMP patients and the Control cohort patients, namely a sharp decline in both cohorts immediately following enrolment.
At the cohort level, most LHDs also showed a similar pattern to the overall cohort, specifically a consistent excess in yearly rate of potentially preventable admissions, potentially preventable readmissions and potentially preventable bed days, compared to the LHD Control cohort.

Predictors of outcomes of CDMP participants

The analysis considered whether particular patients might have benefitted more or less from enrolment in the CDMP, a range of key socio-demographic, health and service utilisation variables that might identify sub-groups of CDMP participants was further examined. The impact of these characteristics of patients on outcome was explored. Interactions between each variable and the effect of the Program was assessed, namely impact on the yearly rate of potentially preventable hospitalisations post-enrolment.

There were few findings of note, with the following being the main ones:

- Only two variables appear to have a strong effect (with a p-value smaller than 0.001): previous number of Emergency Department presentations and whether the patient had Coronary Artery Disease (CAD).
- As the number of pre-enrolment Emergency Department presentations increases, the rate of future (i.e. post-enrolment) potentially preventable admissions increases in both groups. However, the effect of previous presentations on the effect of CDMP follows a slight "J" shape with an absolute excess of the outcome (potentially preventable admissions post enrolment) increasing more sharply as the number of presentations progresses from two presentations, to three or four.
- For CAD, the excess of post-enrolment potentially preventable hospitalisations seen for CDMP participants compared to control patients is larger for those without CAD.

Key messages and implications of the Evaluation

Significant evolution of Program approaches was evident at local levels.

It has been noted that the scale and complexity of delivering such care activities can easily overwhelm even the strongest program settings, let alone an emergent one. It was to be expected therefore that the Evaluation would find an evolving Program. Over time, the Program developed in a number of directions:

- LHDs moved some way towards making the CDMP part of a system of care, with clear entry points, a range of options for care, ongoing assessment of people in the Program and processes for escalation or re-entry for those no longer receiving active support. However in most cases this was still in progress.
- LHDs developed ways of implementing the core elements of the Program – care coordination and health coaching – that suited their local circumstances.
- LHDs identified ways of linking the CDMP with existing services and programs within their LHDs, at a governance and operational level.
- NSW Health (including the LHDs) had to develop the information and communication technology systems and other infrastructure to support the program, for example systems for tracking people in the Program, for confidential exchange of clinical information and single points of contact for enrolment and referral. In many cases, this was still in progress.
- Local developments, allowing the Program to be tailored to local circumstances, also emerged. For example, urban and rural/remote programs evolved differently, reflecting the difference between relatively compact, complex and service rich urban environments and more dispersed rural areas that are often less well served.

However, since inception, Program development has had to compete with Program enrolments. The CDMP began with challenging enrolment targets, which were largely met over the life of the Program until the end of the Evaluation. The drive for enrolments effectively swamped capacity, squeezing the time and attention required for developing the program infrastructure, at both local and state levels.
Enrolment to the program and its interventions predominantly occurred at times of peak acute service utilisation

A consistent feature of the Evaluation findings was that, for most outcomes, enrolment in the Program occurred at around a time peak in acute service utilisation. This finding suggests that the acute sector, by its nature, responds to realised risk not latent risk. This implication presents something of a challenge for the Program model: a fundamental premise of chronic care is the proactive management of future health crisis risk; the Program model - as has been operationalised - manages health crisis risk reactively.

The intention of the Program was to avert unnecessary acute service use. Despite varied local approaches across LHDs a number of aims were shared: identifying and supporting those with greatest needs; providing more preventive care; and reducing the amount of care provided unnecessarily in hospital settings. The finding of a relationship between peak acute service utilisation and enrolment reflects an important possible disconnect between the Program’s ambitions and effective risk identification and mitigation. The findings of the Evaluation suggest that the CDMP was more likely to identify – and respond to - realised risk (current high levels of service utilisation) rather than potential risk (predicted future high levels of service utilisation).

The finding is by no means unique to the CDMP. A similar phenomenon has been reported by other comparable programs, which have targeted similar public health landscapes.

Participation in the CDMP was associated with increased unplanned and decreased planned acute service use

Perhaps the central unifying aim of the CDMP was to reduce potentially preventable hospital utilisation. We found no evidence of a general reduction in potentially preventable admissions. We found an unexpected increase in unplanned admissions, potentially preventable admissions and emergency department presentations for patients enrolled in the CDMP compared to the Control group.

One possible explanation for the findings is that the process of ‘case finding’ identified unmet need. Although it is likely that some of the apparent increase may have been due to incomplete matching of cases and controls, it is more likely that greater attention to at-risk patients may at times identify more patients judged to need admission to hospital. It is possible that when patients first entered into the Program service providers may have identified problems that necessitated hospital admission. The data do not allow determination of whether any additional admissions were appropriate or not.

At the same time, there was no increase in overall service use, that is all hospital episodes, compared to the Control group. This suggests that there were reductions in planned admissions compared to the Control group. The reasons for the observed reduction in planned admissions are not clear. It has been suggested that this may have been due to moving services into primary care settings, an aim of the CDMP.

Altered patterns of service have been reported in other recent evaluations of comparable programs internationally. Implementing case management for at-risk patients was reported as being associated with a reduction in outpatient attendances and planned admissions, but an increase in unplanned admissions in the evaluation of the UK Integrated Care Pilots. The authors noted that the findings were almost the reverse of what might have been expected given the intended aim to reduce unplanned admissions, with the effect reported as most marked in sites focusing on case management of patients at risk of unplanned admission.

There was a dramatic decrease immediately following enrollment in both CDMP and Control patients

It has been repeatedly noted that there is a natural tendency for high risk patients to show reductions in use in the absence of any intervention, a statistical phenomenon called ‘regression to the mean’. If patients are chosen for an intervention based on their current high rates of hospital admissions, we would expect their rates of hospital admissions to reduce over time, even in the absence of a specific intervention. The CDMP, like other programs, enrolled people at the peak of their acute utilisation. This evaluation, like the others, found that unplanned hospital use did not improve in the intervention group compared to the control group, and showed ‘regression to the mean’ effects.
This finding raises two points. The first and most obvious is that an evaluation without an appropriate control group would tend to overestimate the effectiveness of the intervention on hospital use, since some or all of the observed reductions would have happened anyway.

The second and equally important issue is the appropriate outcome measure for programs like the CDMP. On the one hand, there is evidence of limited scope to prevent hospital admissions in the short term for people who have not recently had a hospital admission. By focusing on people with a history of hospital admissions, the programs here and elsewhere have concentrated on those patients more likely to demonstrably benefit from the intervention in the short term. Yet, regression to the mean poses a significant challenge to disentangling real impact from natural change when the outcome of interest is at the extreme end of the spectrum, due to regression to the mean. As a sole outcome suite, acute service use may not be an adequate measurement strategy. Additional data, for example quantification of the impact of programs on the number of GP visits and the intensity of social care use, could provide better explanatory value.

The overall pattern of service use outcomes did not differ by LHD

Despite significant progress over time, and local differences in approach, the service patterns of service utilisation in most cases essentially mirrored those found for the Program overall.

A number of interpretations may - either separately or together – account for this finding. As a starting point, the LHDs are not unitary phenomena, so that model features, service availability and patient need in any particular part of the LHD may not be replicated across the entire service in the geographic catchment. Analysis at the LHD level is necessarily an aggregated and possibly insensitive approach. Using matched controls from within the LHD to some extent accounts for this possibility.

Another interpretation is that the Program had not reached maturity in any LHD, or maturation was stymied in terms of further evolution. While significant evolution was evident, the majority of LHDs had not fully realised the potential of dedicating resources to pre-emptive risk management. To some extent this may reflect the time available for a significant paradigm shift – reaching beyond the acute sector to influence acute sector outcomes. Alternatively, and/or additionally, progress may have been undermined from reaching scale due to LHD needs for a range of systemic and systematic support for local development.

Aboriginal participants in the CDMP were mainly identified through the acute sector, around a time of peak acute service utilisation, with post-enrolment utilisation remaining higher than the Aboriginal Control cohort

The CDMP Aboriginal cohort showed a consistent excess in yearly rate of potentially preventable admissions, potentially preventable readmissions and potentially preventable bed days but not emergency department presentations. As for the overall cohort, enrolment occurred at the peak of utilisation in the pre-enrolment period for both the Aboriginal CDMP cohort and the Aboriginal Control cohort, declining sharply for both groups immediately after enrolment but remaining consistently higher in the CDMP cohort.

Most Aboriginal program participants were identified and referred into the CDMP via LHD services - primarily LHD hospitals (through the 48 Hour Follow-Up Program), and to lesser extent through rehabilitation services and other LHD services. LHD Care Coordinators and 48 Hour Follow Up staff were identified as key to the process of identification and referral of Aboriginal people to the Program.

The prominence of the 48 Hour Follow-Up Program in the CDMP may have been something of a double-edged sword. On the one hand, it attests to the utility of building on existing systems. On the other hand, identification of participants via the acute sector brought with it the previously discussed risks to measurable benefits in the Evaluation.
**External telephone coaching did not appear to improve the outcomes of interest in the Evaluation**

The sample of CDMP participants receiving external telephone coaching from Healthways was an opportunistic one available to the Evaluation. The findings should be treated with some caution, due to potential bias in obtaining the sample.

The Healthways Coaching Evaluation cohort appeared to show significantly higher rates of utilisation post-enrolment when compared to similar control participants not enrolled in the CDMP. However, those differences were smaller than the ones obtained when comparing the entire CDMP cohort to their matched controls. Sensitivity analyses, where Healthways participants were matched to other CDMP participants, supported this finding by showing reduced excess (compared to the Control cohort) in service utilisation in those receiving Healthways Coaching.

Longitudinally, there appeared to be no clear differences in the rate and pattern of service utilisation between the two groups. The overall pattern for the Healthways cohort and the Control cohort over time appeared to be very similar to that already described for the cohort overall, namely commencement of the intervention around a utilisation peak, which was followed by an immediate sharp decline in service use, and then a more steady decline over time.

While caution should be exercised in the interpretation of the results for the Healthways evaluation cohort, it is noteworthy that the findings confirm those of a recent rapid review. It concluded that Telephone coaching for people with chronic conditions can improve health behaviour, self-efficacy and health status; however, the evidence for improvements in health service use was considered limited.

**Implications of the findings for current policy environment**

**The value of commitment to robust monitoring and evaluation**

A clear legacy of the Evaluation relates to the criticality of appropriately assessing the measureable benefit of investment in service innovation over and above usual care. Focusing on areas of need in public health systems very often equates with focusing on high-risk patients, a focus bringing with it a host of measurement related challenges. While this may seem obvious, the principle can come up against resistance at the front line of care provision because of staff perceptions. CDMP staff who had direct patient contact thought that care for their patients had improved, as did staff in the UK Evaluations described herein. A key strength of this Evaluation is that we were able to take account of the natural drop in admissions that occurs when high-risk cases are selected for an intervention. Measurement of what happens in the absence of the intervention/innovation is often difficult and imperfect, but cannot be considered optional.

Importantly, there is strong commitment in the NSW policy arena to building on the lessons of the CDMP program. As a strategic imperative, “NSW is investing in approaches to integrate care and progress towards a health system that routinely provides seamless, effective and efficient care, that responds to all of a person’s health needs across physical and mental health, with connected service provision across different healthcare providers and greater emphasis on community-based services.” Lessons learnt during the CDMP Evaluation will feed into this strategic imperative – with particular focus on Integrated Care as a significant focus of the investment in Integrated Care is to better support people with long term conditions and complex health needs, and be more sustainable in the long run.

**Lessons for evaluations for future programs**

It was an explicit ambition of the Evaluation to provide lessons to take forward in future endeavours. Beyond the imperative to evaluate, several broad suggestions for future strategic directions can be distilled from the Evaluation on what and how to measure:
A multi-dimensional approach with an appropriate suite of outcome measures

An evaluation of an initiative such as the CDMP needs to recognise that the program goes well beyond any particular intervention, relying on system change. As such, the impact of the program is likely to be multidimensional, and the evaluation needs to similarly be multidimensional. The core dimensions in health and social programs are likely to be consumer experience, cost/efficiency and effectiveness/outcomes.

A significant weakness in the current Evaluation is the absence of patient experience data. Patient experience is important for a number of reasons. Patients are clearly central stakeholders in health service improvement initiatives. They can also be a significant and active element of the intervention, as is the case with chronic condition management for instance, not just a passive recipient.

Patient experience data also provide the opportunity for much greater choice in outcome indicators. In the current Evaluation service utilisation patterns provided the outcome measures of interest. There are robust alternatives – self-reported health status, health-related quality of life, independent living for example - which are equally important and might show very different outcomes to those found here. The importance of these types of measures has received significant attention in the international literature in the context of value-based healthcare, where the focus is on value rather than only on cost savings.

Timeliness

A shortcoming of the Evaluation was its lack of timeliness. Quantitative data and analysis became available after several years of Program operation. Similarly, by the time the rounds of process evaluation became available, the programs had already adapted/evolved without the benefit of more complete data.

The issue of timeliness to some extent reflects a widely held view of how best to evaluate interventions where much of the knowledge about the processes and impacts is held locally by those most involved in delivering the change. The evaluation needs to be embedded in the innovation, to become an active ingredient in the cycle of continuous improvement. The impact of hospital-avoidance interventions should be monitored in as close to real-time as possible. If they are not effective, it might be possible to refine their intervention or connected services in order to improve effectiveness.

The balance of resources in the Evaluation between collecting views of participants, views of processes and collecting quantitative data was skewed somewhat towards the quantitative aspects in this Evaluation. The mix was broadly right, in our view; however, it left some elements of the ‘black box’ of local processes/activities/approaches hard to fathom at an operational level. It may be that new data collections, now becoming available through the implementation of Activity Based Funding, might enable more granular process analysis at scale.

Routine data collections will however never fully articulate some critical nuances of drivers of success in local innovation. Ethnographic and observational data - as collected in the Aboriginal evaluation component – should be used to focus on elements such as leadership, how professionals and service users interact, and how work is re-organised in reality as opposed to on paper, and have the potential to offer valuable insight with more intense data collection and provide benefit in the unpacking of the ‘black box’.

Designing programs with evaluation in mind

Ultimately the aim of evaluation in health and social programs is to help understand what works, what does not work, how much it works relative to what it costs, and why. Through providing such understanding, evaluation has the potential to become a core component, a driver even, of continuous improvement. In order to fulfill its potential in this regard, evaluations are most valuable when the program has been designed with its evaluation in mind. The essential starting point is a program that is designed with its assumed causal connections specified. As an example, a central element of the CDMP was care co-ordination. The benefits of co-ordination may not be potentially preventable hospitalisation. Rather it might have its beneficial effects via reduced duplication resulting
in greater efficiency for the system and reduced strain for the patient and provider. At the same time there must be room for adaptive variation, acknowledging that health and social programs are evolutionary.

The process of explicitly articulating, and re-assessing the assumed connections between program components and outcomes can be called a theory of change, a program theory, a theory of action, or a logic model. The literature on this subject is vast, and terminology varied. The approaches all converge on the same premise: articulating the logic of the assumed connections linking the program components to the outcomes provides the basis for an incisive evaluation.

The need for support for systematic development of chronic care across existing systems

The CDMP confirms that there are a very large number of people with chronic conditions, many with co-morbidities. Current services are often fragmented, and many deal with single conditions. All suffer from the same deficits in clinical and patient management systems. The overall aim should be to strengthen the system of chronic disease care as a whole and better integrate existing systems rather than focus on new services (although these may also be needed). The CDMP suggests that this will require considerable investment in infrastructure, training and re-orienting the system to a chronic rather than acute focus.

To some extent and as noted previously in this Report, this direction is one already being taken by NSW Health. There is currently a concerted push for integration of systems and provision of integrated care to people living with chronic disease in NSW. This is reflected in the recently formulated NSW Health ‘Integrated Care Strategy 2014-2017 with commitment by NSW Health of $120 million over four yours to implement new, innovative locally-led models of integrated care across the State.

The need for support for local development

The CDMP has shown the importance of tailoring a program to suit local circumstances, while still providing overall direction. While it may seem obvious in theory that CDMP activities should be scaled to match local capacity, this was not always the case in practice. In some cases, enthusiastic local leadership produced expectations that were difficult to realise in practice. Changes to practice often took much longer to achieve than anticipated.

One approach is to adopt functional specifications and provide guidance on the evidence relating to each function, leaving it to the service to determine how this is best done. Functional requirements designate what is to be achieved, recognising that how they are to be achieved will vary by local characteristics.

Harnessing the potential of extending into primary care

This evaluation suggests that acute care is not the best place to identify people who could benefit from care coordination and self-management support. By the time they are identified it is too late: their condition has already been significantly exacerbated, and indeed many are already on the road to recovery, with or without extra intervention.

Risk stratification can be used in primary care to identify people at risk of hospitalisation and appropriate preventive measures put in place. Risks are likely to be better understood and preventive measures better implemented in primary rather than acute care. The international evidence suggests that selecting patients based on high utilisation of acute care misses high-risk patients who do not use acute care, and as an approach did not identify the factors that drive admissions. Integrating chronic disease management into routine funding and care, in contrast, has shown the best combination of health outcomes and cost savings.

Yet, an overwhelming feature of the CDMP overall was low levels of engagement with primary care, including General Practice and Aboriginal Community Controlled Health Services (ACCHSs), who deliver a model of
comprehensive primary health care for Aboriginal people which includes a major focus on chronic disease prevention and management.

In the current Australian health care system it is challenging for a state health system to invest in primary care, or for the Commonwealth and state to work in partnership to improve care. However taking even small steps in this direction are indicated by the Evaluation findings and by the international evidence.
1 Background

1.1 Origins of the Chronic Disease Management Program

An impetus for change

The need for reform of health systems originally established for the delivery of acute and episodic care in countries such as Australia is well established. Oriented towards episodic care, health systems are struggling to provide the complex, long-term care necessary for the increasing number of patients living with chronic diseases as populations age. In Australia, chronic disease contributes to more than 70% of the disease burden in Australia - a figure expected to increase to 80% by 2020. Not only is the burden of disease attributable to chronic diseases high and predicted to increase, but associated health care costs are rising rapidly: chronic non-communicable diseases account for 70% of health expenditure.

It was this ‘tsunami’ of chronic disease and escalating health costs that lead NSW Health to formulate a business case in 2008 for investment in developing approaches to harness the continuum of care to better manage individuals living with chronic disease in the state. The result was the Chronic Disease Management Program (CDMP).

The business case for investing in developing an approach to harness the continuum of care

The CDMP was formulated as a new approach to managing the health of patients aged 65 years or older who had serious chronic illness. Specifically, it was to be a proactive approach to managing the health of individuals aged 65 years or older with chronic disease who had health risks or who had recently experienced a major health event and could benefit from preventive outreach to improve the management of their health and avoid future adverse events.

The model for chronic disease management proposed in the Business Case of the CDMP described two objectives:

1. To improve the quality of health outcomes for the target population of the Program; and
2. To reduce the health outlays significantly driven by the growth in the size of the population targeted by the Program and the rising costs of their health care.

The key assumptions underlying this Business case were as follows:

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• Hospital avoidance – by supporting individuals aged 65 or older with serious chronic illness and seeking to optimise patient wellness at home;
• More people to receive self-management support rather than care coordination (approximately an 8:1 ratio when the Program was fully operational) – to be achieved through targeted enrolment and risk stratification to align patients to appropriate management based on clinical risk with the focus of the Program being patients categorised at ‘very high risk’\(^9\) or ‘high risk’\(^10\) or experiencing an acute event and/or need coordinating health care services; and
• A four year Return on Investment of 1.39.

As well as these assumptions, there was an expectation at the time of preparation of the business case that the Program would be provided in partnership with GP to enable integrated care, and contact centres would be established in the then 8 Area Health Services (AHSs) to provide telephonic care coordination and telephonic health coaching. Later, with Ministerial approval, it was agreed that a state-wide health coaching service for chronic disease management would be established as an outsourced service.

1.2 Policy Landscape

A central focus of health reform over the last 2 to 3 decades in all jurisdictions in Australia has been the care and management of individuals living with chronic disease: some reforms have focused on health financing and others have aimed to improve coordination of care by making changes to the governance of the health system at the local level\(^11,12,13\). These reforms are significant, they are ongoing and they set the scene for the development of the CDMP.

1.2.1 National landscape

Significant national level reform was initiated in 2008 with the establishment by the then Federal government of the National Health and Hospital Reform Commission. The mandate of this Commission was to conduct the most comprehensive review of Australian’s health system in 20 years and the final report of the Commission - *A Healthier Future for All Australians* - featured a Blueprint for Reform. The concept of ‘connecting care’ constituted a core pillar of the recommendations of this Report and included priorities such as: strengthening and integrating primary care and care of ambulatory sensitive conditions in community settings and improving system connectivity.\(^14\)

The Commonwealth’s 2010 report *‘A National Health and Hospitals Network for Australia’s Future’* also mapped out major structural reforms to establish the financing and governance foundations of a National Health and Hospitals Network. As an integral part of this system-wide reform, the Government specified that jurisdictions introduce Local Hospital Networks (which became Local Health Districts (LHDs) in NSW) and set up

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\(^9\) Approximately 2% of the NSW population aged 65 years or older - NSW Health Chronic Disease Management Program “Model of Care, Implementation Strategy and Costings – Final Report (DRAFT: For Discussion Purposes Only), April 2008.

\(^10\) Approximately 16% of the NSW population aged 65 years or older - NSW Health Chronic Disease Management Program “Model of Care, Implementation Strategy and Costings – Final Report (DRAFT: For Discussion Purposes Only), April 2008.


primary health care organisations (Medicare Locals) to work closely together in delivering health care to local populations.\(^\text{15}\)

These reforms recognised the need to overcome system fragmentation and establishment of Medicare Locals (MLs) to replace Divisions of GP was a key platform to improve service coordination and population health planning in the community at a regional level. The new primary health care organisations, MLs, were rolled out in three tranches in 2011 and 2012\(^\text{16}\) and were mandated to coordinate primary health care delivery and tackle new health care needs by supporting coordination of care and management of service gaps by working closely with LHDs.

As well as changes to improve service coordination and population planning in the community, Activity Based Funding (ABF) was introduced to bring greater efficiency and accountability to the funding and purchasing arrangements for health services provided through public hospitals as outlined in the National Health Reform Agreement.\(^\text{17}\) To this end, the Commonwealth government established the Independent Hospital Pricing Authority – to calculate and deliver an annual National Efficient Price for federal activity-based funding of state-run hospital services. Activity in all service types is described using a single National Weighted Activity Unit (NWAU). Each year the dollar value of an NWAU changes – to reflect changes in resource use and model changes - but the unit value of a hospital activity of a particular type remains the same year on year.\(^\text{18}\)

Better management of chronic conditions is also a key priority area of the National Primary Health Care Strategy released in 2010.\(^\text{19}\) Other key priority areas are: improving access and reducing inequity; increasing the focus on prevention; and improving quality, safety, performance and accountability.

The election of a new Federal Government in 2013 has seen the focus of health reform shift with notable changes to the National Partnership Agreement on Improving Public Hospital Services – specifically reduced public hospital funding over the 4 year forward estimates; a proposal to introduce co-payments for a variety of Medical Benefits Schedule and Pharmaceutical Benefits Schedule funded services, and significant changes recommended to the administration and governance of GP. The final changes, and their impact on integrating care across the care continuum as intended by CDMP, remain to be seen.

1.2.2 NSW Health strategy and policy

Recent health reform by the NSW Government builds on a track record of investment in programs and strategies to manage chronic disease\(^\text{20}\), and developments in the NSW State health agenda align with the overarching national health reform movement for chronic disease management. The development and implementation of the CDMP falls into this category.


\(^{16}\) The Medicare Locals Network includes 61 Medicare Locals covering the whole of Australia. Medicare Locals were established in three tranches: Tranche 1 (19 Medicare Locals) – from 1 July 2011, Tranche 2 (18 Medicare Locals) – from 1 January 2012, and Tranche 3 (24 Medicare Locals) – from 1 July 2012 (Medicare Locals Operational Guidelines – September 2012, DOHA).


\(^{20}\) Key initiatives and strategies over the last two decades include: NSW Chronic Care Program (2000), NSW Chronic Disease Prevention Strategy 2003-2007, the NSW Chronic Disease Strategic Framework 2006-2009, the Chronic Care for Aboriginal People Program (and its initiatives such as 48-hour follow-up from 2008) and HealthOne NSW the Integrated Primary and Community Health Policy (2007-2012).
The Special Commission of Inquiry into Acute Care Services in NSW Public Hospitals was particularly influential in giving reform work in NSW new direction with the publication of its findings and final report (the Garling report) in November 2008. The Garling report highlighted the need for integrated and shared care for people with chronic conditions and was instrumental in establishing the Chronic Disease Management Office in NSW Health. The CDMP was developed and implemented under recommendation 3 of ‘Caring Together – The Health Action Plan for NSW’ released in March 2009 in response to Garling’s recommendations.

More broadly, State planning in NSW mandates achieving coordinated, integrated and efficient use of the health system and its resources by people with chronic disease. The goals of the CDMP clearly align with priorities distilled in the NSW State Plan and accompanying NSW State Health Plan including: championing prevention and early intervention, reducing potentially preventable admissions to acute care services by older people with chronic conditions, supporting people to better manage their behaviour and illnesses and improving the quality of life for people with chronic illnesses. Similarly, the CDMP approach adheres to the NSW Ministry of Health’s efficiency planning in response to Garling’s recommendations.

NSW Governance Review

NSW Health significantly extended the reform program in 2011 when the organisation undertook a Governance Review and started implementing dramatic changes in governance arrangements. The review, and its ensuing implementation, focused on the following key elements of NSW Health: the functions, responsibilities, structure and relationships and their alignment with the Government’s policy direction.

The cascading changes of greatest relevance to the implementation of the CDMP - as an integrated model of care state-wide - include:

- A change from a more centralised Department to a more strategic Ministry, and devolution of the governance and planning of health services for the population of NSW to 15 LHDs and 2 Specialty Health Networks (including redeployment of clinical and support services from former AHSs to the new LHD structure);
- A shift in the service delivery model between a smaller, re-branded and strategy focused Ministry of Health and the LHDs to a purchaser-provider arrangement. Service Agreements - as outlined in the 2011 National Health Reform Agreement and Performance Management Frameworks now operate to articulate expectations and monitor performance. Accountability is monitored through reporting, performance targets with activity-based or block funding arrangements as appropriate to the service. Strengthening of the following four ‘Garling pillars’ for critical health support services including:

  1. The Agency for Clinical Innovation
  2. The Clinical Excellence Commission
  3. The Health Education and Training Institute
  4. The Bureau of Health Information

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27 The four ‘Garling pillars’ have been expanded to include the Cancer Institute NSW and NSW Kids and Families.
A change to the split of responsibility and evolving Program governance between the Ministry of Health and Agency for Clinical Innovation (ACI), which has seen the Ministry take on the strategic and policy direction associated with the Program and the ACI providing implementation support to LHDs on a day-by-day and month-by-month basis as well as more generally a remit for innovative models of state-wide health service delivery.

**Activity Based Funding in NSW**

The Commonwealth Government lead health reforms stipulated the introduction of ABF on 1 July 2012 for in-scope hospital services throughout the country, and ABF arrangements were operationalised in NSW in mid-2012. In 2013/14 funding to LHDs in NSW was based on a combination of ABF for selected services and block funding with 84 facilities in scope for ABF for the following services: acute admitted services, emergency departments, non-admitted services, sub and non-acute services, and mental health (admitted). ABF gives the transparency needed for local planning and decision making and as such ABF is a funding reform seen as a means to achieve better patient care and efficiency.

**Strengthening the role of Primary Health Care in NSW**

Primary Health Care is critical to providing quality, effective and empowering care for people with chronic disease. Strengthening and integrating the role of primary health care providers is a common thread of recommendations from the Garling report (2008), the National Health and Hospital Reform Commission Report (2009) and the National Primary Health Care Strategy (2010).

IPART also highlighted the importance of the primary health care sector in championing effective management of chronic disease through integrated systems. Providers of Primary Health Care in NSW – including community health services throughout NSW - have a critical role to play in the success of the State-based partnership approach being implemented by the CDMP.

As part of its significant reform program, NSW Health clearly recognises the new turf to be navigated by GP, and the strengthening of the partnership between the primary care sector and the CDMP is seen to be a key enabler to the delivery of integrated chronic disease services across NSW. To this end, NSW Health has continued to engage with its GP partners to explore further options for funding and support to deliver the CDMP collaboratively to its patients.

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36 NSW Health. NSW Health: Investing in General Practice for Chronic Disease (General Practice Funding Models version 4). North Sydney: NSW Department of Health, 2012.
More recently the focus of engagement with primary care in NSW has been via the MLs throughout the state. This focus will shift to Primary Health Networks when these are established and MLs disbanded in mid-2015 in line with recommendations in the ‘Review of Medicare Locals’ completed by John Horvath in 2014.37

Integrated Care in NSW

Strengthening the role of Primary Health Care continues to be a strong theme in the in NSW Health policy landscape. There is currently a concerted push for integration of systems and provision of integrated care to people living with chronic disease in NSW. This is reflected in the recently formulated NSW Health ‘Integrated Care Strategy 2014-2017’ with commitment by NSW Health of $120 million over four years to implement new, innovative locally-led models of integrated care across the State. Central to the process will be LHDs working in partnership with other local health agencies from across the spectrum of care including partners in primary and community care to partners in the acute care sector, and to those working in the public and private sector and the not-for-profit- sector. 38

This strategy document notes that ‘integrated care involves the provision of seamless, effective and efficient care that responds to all of a person’s health needs, across physical and mental health, in partnership with the individual, their carers and family”. This is in line with the Nuffield Trust report published in 2011 into integrated care in the National Health Service which states that “integrated care is a term that reflects a concern to improve patient experience and achieve greater efficiency and value from health delivery systems” and which aims “to address fragmentation in patient services, and enable better coordinated and more continuous care” (p. 3).39

1.3 Assumptions and Intentions of the Program

The CDMP was developed to meet the need for integrated care across primary, community and acute health settings for people aged 65 years or older with chronic disease in NSW at risk of potentially preventable or unplanned hospitalisation. It aimed to do this by supporting these people to better manage their chronic conditions in order to improve their health, well-being and quality of life, prevent complications, and reduce their need for hospitalisation.

At inception the CDMP had the following key aims:

- Increase people’s capacity to understand and manage their conditions
- Reduce the progression and complications of their disease
- Improve their quality of life
- Support their carers and families
- Enable better advance care planning and end of life decision making
- Reduce unplanned and potentially preventable admissions to hospitals
- Improve the health system’s capacity to respond to people with multiple health and social needs – significant micro-system reform

To be enabled by the following principles: 40

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1.3.1 Focus on hospital avoidance

As the Program is targeting a patient cohort in NSW at high risk of potentially preventable and unplanned hospitalisations due to their chronic conditions, changes in potentially preventable and unplanned hospitalisations are primary outcomes of the Program and important outcomes to be evaluated. Specifically, the following health service utilisation outcomes were considered in the Evaluation:

- Unplanned hospitalisations
- Potentially preventable hospitalisations
- Re-admissions within 28 days
- Emergency department presentations

More detail on these outcomes is given in Section 2.3.3.

1.3.2 Program Service Model

There are 6 elements to the Operational Model of the CDMP which are shown in Figure 1 below:

Figure 1 CDMP Operational Model*

*source: NSW Chronic Disease Management Program – Connecting Care in the Community (Service Model 2013)

A key component of the CDMP since inception has been targeted enrolment (detailed in Section 1.3.4 Targeting below). Systems for identifying and enrolling patients are central to the process of targeted enrolment. Once patients are identified and enrolled to the Program a comprehensive assessment process is completed and patients assigned to the appropriate model of care. Monitoring and review of the patient cohort enrolled to the Program is seen to be an important component of a program designed to improve the care and management and health outcomes of individuals living with long-term conditions.
1.3.3 Evidence based interventions: case management and self-management support

Broadly, the CDMP incorporates two models of patient-centred and holistic care to help people with chronic disease in NSW access appropriate services, and manage their care needs, multi-morbidities, disease signs and symptoms, and medications. These models as planned were:

- **Care Coordination** – for patients having a complex set of conditions who make frequent presentations to emergency departments, and who are at VERY high risk for experiencing an acute event and need help coordinating services. Patient care is coordinated between primary, acute and community sectors, and across clinical specialities and is facilitated by Program Care Coordinators (and contact centres where they exist). Development of shared care plans with the patient, General Practitioner, and specialists is central to this process.

- **Health Coaching** – for patients with one or more chronic conditions who are frequent presenters to emergency departments or recently experienced a major health event, and with identified care gaps; these patients are at HIGH risk of experiencing an acute event and often need, support to manage lifestyle risk factors, medication management and support for interaction with health care providers or biometric monitoring. The focus of self-management support on the Program is to ensure understanding of treatment plans and to promote positive health behaviours.

**Evidence base for care coordination**

Care coordination is recognised as an important aspect of high-quality health care delivery – a means to improve patient outcomes and also contain overall health care costs. The 2013 Service Model of the NSW CDMP notes care coordination “can be considered as the deliberate organisation of care to a person to facilitate the timely delivery of care in a manner that is consistent with the person’s clinical and psychosocial needs” (p. 13). There is, however, no universally agreed definition of care coordination.

Effective care coordination is a critical element of chronic disease management and the term covers initiatives operating at a variety of levels – at the patient and service provider level, at the health service organisation level, and at the health system level. ‘Care coordination’ is a broad concept and is used in a wide range of circumstances, and evidence for its effectiveness is mixed. A systematic review completed in 2006 by researchers from the Centre for Primary Health Care and Equity at the University of New South Wales that

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42 Estimated to be approximately 2% of the population of NSW aged 65 years or older - NSW Health Chronic Disease Management Program “Model of Care, Implementation Strategy and Costings – Final Report (DRAFT: For Discussion Purposes Only), April 2008.


44 As the Program matured the focus shifted from Health Coaching to Self-Management Support and LHD s provided health coaching/self-management support through a variety of different mechanisms in their Programs, for example through external telephone coaching provided by Healthways Australia; web-based coaching programs such as the COACH Program, or through provision of coaching training to staff in the District by Health Change Australia.

45 Estimated to be approximately 16% of the population of NSW aged 65 years or older - NSW Health Chronic Disease Management Program “Model of Care, Implementation Strategy and Costings – Final Report (DRAFT: For Discussion Purposes Only), April 2008.


examined coordination of care within primary care (with other sectors) found that care coordination activities can be stratified into one of two broad categories - processes used by clinicians or program staff to coordinate care (eg: communication between service providers) and structural arrangements put in place to support coordinating activities (eg: use of systems to support coordination such as shared records). 48 According to a recent comparative analysis of five United Kingdom based case studies of care-coordination programs for people with chronic and complex long term conditions, there is a lack of evaluation and measurement of care coordination programs. 49 While this is the case, a systematic review into the effectiveness of case management for people with advanced and serious illness found moderate evidence that interventions targeting continuity, coordination, and transitions in this cohort improve patient and caregiver satisfaction, but little evidence of improvements in other outcomes including changes in quality of life of the patient and health care utilisation. 50 Likewise, a systematic review into the effectiveness of case management in reducing the risk of unplanned hospital admissions in older people showed that the various interventions had limited effect on unplanned hospital admissions. 51 There is also evidence of effectiveness of transitional care arrangements to prevent recurrent hospitalisations among high-risk low income individuals with complex chronic medical conditions. 52,53

**Evidence base for self-management support**

Managing a chronic disease is a complex process that typically requires individuals to manage a number of health-related factors themselves. While both clinicians and patients have significant roles to play in this process, researchers estimate that approximately 80% of the care for people with long term conditions undertaken by the patient themselves or their carers. 54 For this reason self-management support is seen to be an important component of chronic disease management.

There is a growing evidence base supporting the notion that self-management is worthwhile, and although a wide range of activities are frequently described as ‘self-management support’, it is clear that some activities are more effective than others: proactive strategies to support behaviour change work better than passive strategies such as information provision. 55 The findings of individual studies are mixed; however, the totality of evidence would suggest that supporting self-management can have positive impacts on people’s attitudes and behaviours, quality of life, clinical symptoms and use of healthcare resources. 56,57,58,59

1.3.4 Targeting

In general, the Program aims to target people with the chronic diseases that result in the most frequent presentations to hospitals, drive the highest health care costs, and respond best to improved care coordination and self-management support, namely:

- Diabetes
- Congestive Heart Failure
- Coronary Artery Disease
- Chronic Obstructive Pulmonary Disease, and
- Hypertension

While the target conditions have remained constant, the initially focus of the Program was on enrolling people at ‘very high risk’ of hospitalisation aged 65 years or older with 3 or more potentially preventable hospitalisations in a given year. This algorithm was later discontinued and a decision was made to open the Program up to individuals aged 16 years or older at high risk of hospitalisation for their chronic condition.

Further to this, at the Program’s inception there was an expectation that the majority of participants would receive self-management support and the minority would receive care coordination – in line with NSW population estimates of individuals aged over 65 at very high risk or high risk of hospitalisation.

This was to be achieved through targeted enrolment and risk stratification to align patients to appropriate management based on clinical risk with the focus of the Program being patients categorised at ‘very high risk’ or ‘high risk’ or experiencing an acute event and/or need coordinating health care services.

In 2012, leveraging the existing Patient Flow Portal, the Admission Risk Tool was developed to identify patients who require assessment for possible entry into the Chronic Disease Management Program. The tool allows real-time identification of patients who are at high risk of readmission based on a complex algorithm using quick and easy to use filters: multiple unplanned admissions, multiple unplanned admissions under a specified or same specialty, 28 day readmission with emergency department presentation, 28 day readmission, more than 5 ward moves in the current admission, Aboriginal and Torres Strait Islander status and remoteness.

Inflated targets for recruitment of Aboriginal people to the Program

In recognition of the higher prevalence of chronic disease in Aboriginal people the Ministry of Health set inflated targets for recruitment of Aboriginal people to the Program: 5.5% compared to a state Aboriginal population of 2.3%.

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60 Asthma and renal disease were target conditions for Aboriginal people in early stages of Program development; however, the target conditions for Aboriginal people were subsequently changed to those of non-Aboriginal people.
63 Approximately 16% of the NSW population aged 65 years or older - NSW Health Chronic Disease Management Program “Model of Care, Implementation Strategy and Costings – Final Report (DRAFT: For Discussion Purposes Only), April 2008.
1.3.5 Customised models for local needs

LHDs were encouraged to implement a program and models of care in line with broad directives outlined in Section 1.3 Assumptions and intentions of the Program. There was, however, recognition by the Ministry of Health in the early stage of implementation of the Program that LHDs would have to be able to customise the Program and models of care to their particular circumstances based on a variety of different factors including:

- Geographic spread of the LHD and mix of urban, regional and remote areas within the District;
- Health need of the populations to be served by the Program;
- Vulnerable groups in the District, such as Aboriginal people or Culturally and Linguistically Diverse groups;
- Existing health infrastructure for the Program to build on;
- Health and social services available in the District; and
- Existing relationships within and beyond the acute sector to the primary care sector and from public providers to private providers and non-government organisation providers.

1.3.6 Flexible funding arrangements

A key assumption underpinning the Business Case developed in 2008 for the CDMP was that there would be a return on investment to NSW Health - primarily resulting from reduced potentially preventable hospitalisations of individuals enrolled to the Program stratified to either care coordination or self-management support. Further to changes in potentially preventable hospitalisation, other significant health service utilisation changes might result from improved care and management on the CDMP.

1.3.7 Program funding and resource

Total funding for the Program to the end of the 2014/15 financial year amounted to $198,538,553 (including funding escalations over the term of the Program). Breakdown of this amount by financial year from the commencement of funding in the 2009/2010 financial year – before and after escalation was applied - is shown in Table 1 below:

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65 Email correspondence dated 16 September 2014 from Acting Associate Director, Integrated Care Branch, NSW Ministry of Health.
Table 1 Chronic Disease Management Funding from 2009/10 - 2014/15 (with escalation funding)

<table>
<thead>
<tr>
<th>Allocation</th>
<th>Total annual funding</th>
<th>Total without escalation (in either 09/10 or 11/12 dollars)</th>
<th>Escalation to apply (%)</th>
<th>Total with escalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original allocation</td>
<td>2009/10</td>
<td>$21,500,000</td>
<td></td>
<td>$21,500,000</td>
</tr>
<tr>
<td></td>
<td>2010/11</td>
<td>$21,500,000</td>
<td>3.4454</td>
<td>$22,240,761</td>
</tr>
<tr>
<td>2nd allocation</td>
<td>2011/12</td>
<td>$36,400,000</td>
<td>2.568</td>
<td>$37,334,752</td>
</tr>
<tr>
<td></td>
<td>2012/13</td>
<td>$36,400,000</td>
<td>2.5</td>
<td>$38,268,121</td>
</tr>
<tr>
<td></td>
<td>2013/14</td>
<td>$36,400,000</td>
<td>2.5</td>
<td>$39,224,824</td>
</tr>
<tr>
<td></td>
<td>2014/15</td>
<td>$36,400,000</td>
<td>1.9</td>
<td>$39,970,095</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$198,538,553</td>
</tr>
</tbody>
</table>

* These funds were allocated to the LHDs and Specialty Networks (including St Vincent’s Health Network)

The budgetary allocation across the Program in 2014/15 of just under $40 million can be broken down into $34 million invested recurrently in the LHDs and Speciality Networks, with the remained held centrally (by the ACI and the Ministry of Health). Initiatives implemented by the Sydney Children’s Hospital Network and the Justice Health and Forensic Mental Health Network are the subject of separate evaluations.

An additional payment of approximately $2 million per financial year was provided to the LHDs under the Indigenous National Partnership Agreement to the LHDs.

The Evaluation Team has not collected information on expenditure of CDMP funds by the LHDs on staffing and other resource requirements such as information and communication technology.

1.4 This report

1.4.1 Purpose of the report

This report provides an overview of the NSW Health CDMP at a mature stage of program implementation. The period considered represents the start-up or establishment phase of the Program in 2010 through development and roll-out by LHDs of a more mature program into late 2013. It is an opportunity to take stock of progress in development of the service delivery model in the different LHDs, describe who is being enrolled to the Program, and describe changes in health service utilisation of program participants. A further focus of this report is changes in the costs of service provision to this cohort of patients as compared to an eligible cohort of people not on the Program.

The purpose of this report is to report against evaluation aims, specifically to:

- Describe the way the Program has been implemented at LHD and/or ML level (including factors that influenced the development of the various programs and differences in the ways programs have been implemented which may explain differences in reach and effectiveness);
- Describe patterns of health service utilisation of Program participants (and a matched cohort of individuals eligible for but not on the Program) with an examination of costs associated with service provision; and
- Describe the contribution of the Program to the development of more integrated and coordinated chronic disease care for Aboriginal people at risk of potentially preventable hospitalisation.

Chapter 3 of the report describes the findings of the Evaluation in the following sections:

- Section 3.1 describes Program development from 2011 to 2014 including the core features of program models as at early 2014; this section also reports on differences between selected subgroups of program models based on a number of different features including geographical location, location of care coordinators, centralisation within the LHD, governance structure and so on.
• **Section 3.2** reports on the characteristics of CDMP models and implementation for Aboriginal people in case study sites; a key component of this section is the intersection of the Program with other key programs (and service providers) providing care and management to Aboriginal people living with chronic disease.

• **Sections 3.3 and 3.4** report the findings of the quantitative analysis of the Evaluation as follows:
  o A description of the derivation of cohorts for evaluation purposes (including the cohorts for matched analyses) and an overview of the demographic characteristics of the CDMP Evaluation cohort; these include the overall CDMP Evaluation cohort, the Aboriginal Evaluation cohort, and the cohort of CDMP participants who received external telephone coaching;
  o A description of the derivation of matched cohorts using propensity scoring and an overview of matching quality;
  o An overview of health service utilisation of the CDMP Evaluation cohort and the Control cohort (both unmatched and matched including survivors only) from January 2011 to the end of the evaluation period in late 2013 focusing on: all hospitalisations, potentially preventable admissions, potentially preventable readmissions (unplanned admission followed by an potentially preventable readmission), emergency department presentations, and potentially preventable bed-days;
  o The same overview of health service utilisation as described above was completed for the Aboriginal Evaluation (and Aboriginal Control) cohorts and for the CDMP cohort receiving Healthways coaching and a matched Control cohort;
  o An overview of service utilisation at the individual level over time to compare changes in service use after enrolment in the CDMP to service use before enrolment to the Program; these analyses were completed for the matched CDMP Evaluation and Control cohorts and focused on: all hospitalisations, unplanned admissions, potentially preventable admissions, potentially preventable bed-days, and emergency department presentations;
  o The same overview of health service utilisation as described above was completed for the Aboriginal Evaluation (and Aboriginal Control) cohorts and for the CDMP cohort receiving Healthways coaching and a matched Control cohort;
  o A description of the monthly rate of death for matched CDMP Evaluation and Control cohorts over time from 2007 to the end of the evaluation period in late 2013 – and for the matched Aboriginal Evaluation (and Aboriginal Control) cohorts and for the CDMP cohort receiving Healthways coaching and a matched Control cohort;
  o A sub-analyses for each LHD replicating the analyses undertaken for the overall cohort; and
  o An overview of predictors of outcomes for CDMP participants.

**Chapter 4** of the report discusses the key findings of the Evaluation and their implications for future policy decisions.

**Intended audience**

This report is intended for the NSW Ministry of Health and the Evaluation Steering Committee in the first instance. Arrangements for an appropriate feedback of findings to the LHDs to inform their activities and cross-fertilise are in train.
2 The Evaluation

2.1 Overview

2.1.1 Mixed methods approach

The process evaluation aimed to:

- Describe the way in which the Program has been implemented at LHD and/or ML level
- Describe staff views of the strengths, weaknesses and achievements of their program
- Describe staff satisfaction with their program and their roles in it
- Identify differences in the way the Program has been implemented which may explain differences in reach, effectiveness, costs or benefits, patient or provider satisfaction, including any variations from the prescribed program
- Derive lessons which may be relevant to similar programs or initiatives

The quantitative evaluation aimed to:

- Describe patterns of service utilisation
- Assess the costs of service utilisation
- Identify the impact of program participation on utilisation and associated costs
- Consider the influence of local models on the impact of program participation

The major focus of the process evaluation was to describe the implementation of the program, describe perceptions of the strengths, weaknesses and achievements of programs, to identify differences that might be associated with differences in outcomes and to derive lessons. There was less focus on describing staff satisfaction.

The Aboriginal evaluation component using a mixed methods approach:

The process evaluation aimed to:

- describe how the Program has been implemented in LHDs for Aboriginal people
- describe key staff views of the strengths, weaknesses and achievements of their program as it relates to the care and management of Aboriginal people
- derive lessons which may be relevant to similar programs or initiatives
- describe the way in which the NSW Health CDMP intersects with other key programs providing care and management for Aboriginal people living with chronic disease in NSW

The focus of this component of the Aboriginal evaluation was on the contribution of the Program to the development of more integrated and coordinated chronic disease care for Aboriginal people (at risk of potentially preventable hospitalisation). This component also explored the extent to which the CDMP intersects with other key programs providing care and management to Aboriginal people living with chronic disease in NSW.

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66 The NWAU data needed to assess the costs of service utilisation were largely incomplete at the time of analysis and reporting; therefore this aspect of the quantitative evaluation was not undertaken.

67 The NWAU data needed to assess the costs of service utilisation were incomplete at the time of analysis and reporting; therefore this aspect of the quantitative evaluation was not undertaken.
The quantitative evaluation aimed to:

- describe patterns of service utilisation of Aboriginal people on the Program and those eligible for but not on the Program
- assess the costs of service utilisation of Aboriginal people on the program and those eligible for but not on the Program
- identify the impact of program participation on utilisation and associated costs
- consider the influence of local models on the impact of program participation

2.1.2 Program logic

A logic model was developed to guide the process evaluation (Figure 2). This describes the key evaluation domain areas and the elements within them and the relationships. The key domain areas are: program governance and management, the model of organisational collaboration and the model of care. The evaluation logic informed the scope and focus of data collection and the analysis. The specific analytic questions that the process evaluation set out to address were:

- What variations in implementation impact on achieving intermediate outcomes and explain the variation in program performance?
- What contextual factors (including demographics, history etcetera) influence the variations in implementation?

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68 The NWAU data needed to assess the costs of service utilisation were incomplete at the time of analysis and reporting; therefore this aspect of the quantitative evaluation was not undertaken.

69 The NWAU data needed to assess the costs of service utilisation were incomplete at the time of analysis and reporting; therefore this aspect of the quantitative evaluation was not undertaken.
Figure 2 Logic Model
2.1.3 Specific objectives of the Evaluation

The primary objectives of the Evaluation of the CDMP were to measure the impact, reach, equity and costs of the Program, considering:

- The impact on the number of bed days arising from unplanned and/or potentially preventable hospital admissions, compared with usual care;
- The impact on quality of life, compared with usual care;\(^{70}\)
- The extent to which the assumptions in the Business Case of net economic benefit to the NSW government are correct;
- The measurement and valuation of the economic (including financial and non-financial) costs and benefits of the CDMP, including utility based measures of quality of life and the quantum improvement in these compared to usual care; and
- The extent to which the distribution of program reach and outcomes reflects the needs of the populations served.

Due to significant changes to the Program and Evaluation landscape over the implementation of the Program and course of the Evaluation, changes were made to the Evaluation methodology. The refocussed Evaluation considered the following:

- Health service utilisation data for CDMP Participants registered from 2007 to December 2013 including the Healthways telephone coaching\(^{71}\) cohort;
- Health service utilisation data for the available Control cohort excluding CDMP cohort;
- Health service data available to end 2013 for CDMP and control cohort;
- Early economic evaluation to the extent possible; and
- Interpretation of variation in utilisation by LHD in light of program models implemented.

The objectives related specifically to cost including the business case and economic benefits of the Program were not a focus of the Aboriginal evaluation component.

2.2 Data sources and methodology

2.2.1 Process data collection

There were 3 tranches of data collection: an initial high level scan of all LHD programs, mid-term in depth case studies of seven programs (4 metropolitan and 3 rural LHDs), and a final high level scan. Each stage was informed by the previous data collection. In this way the evolution of the Program, as well as its features at any point in time were available for analysis. The timing, focus and methods of each data collection are described in Figure 3 below:

\(^{70}\) Quality of life and self-reported health of patients on the Program was to be assessed using a patient survey (including the SF1). This component of the Evaluation was discontinued due to difficulties around consenting patients to the Evaluation (as well as difficulties LHDs had recording CDMP patients SF1 scores over time in the MDS) and when an alternative means of obtaining de-identified linked health service utilisation data was made available to the Evaluation with the establishment of the CDMP Outcomes Register under revised provisions of the Public Health Act in 2013.

\(^{71}\) Healthways Australia provides Telephone Health Coaching Services to eligible NSW Health patients as part of the NSW Chronic Disease Management Program in three LHDs – South Eastern Sydney LHD, Illawarra Shoalhaven LHD and Hunter New England LHD. The telephone health coaching provided by Healthways lasts for 6 months and for this period registered nurses provide personalised health coaching that promotes patient responsibility and focuses on what an individual can actively do to improve their own wellbeing. The Healthways health coaches target lifestyle factors that may be inhibiting the wellbeing of the individual like exercise, nutrition, stress, smoking and medical adherence.
Figure 3 Overview of process evaluation data collection

<table>
<thead>
<tr>
<th>High level scan</th>
<th>In depth Case studies</th>
<th>High level scan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document analysis</td>
<td>3 day site visits. Interviews with program managers, governance reps, other LHD staff, MLs, some GPs, consumer groups</td>
<td>On-line survey with LHDs &amp; MLs Interviews with LHD program managers</td>
</tr>
</tbody>
</table>

Dec 2011-Feb 2012 | Feb-April 2013 | April 2014

**Initial high level scan**

There were two major sources: a) Presentations by program coordinators in each LHD to a state-wide meeting held in September 2011; b) Semi-structured telephone interviews with each program held during December 2011-January 2012, with follow up calls where needed.

Twelve interviews were held that involved 23 people from 15 LHDs. Data was summarised from each of the presentations and emailed back to participants prior to the telephone interviews. The telephone interviews sought to collect additional information that clarified and expanded on the elements of the Program. As the interviews were to clarify and elaborate on the information provided at the state-wide forum and the focus was on description of the Program, formal ethics consent was not required.

**In-depth case studies**

The mid-term process evaluation involved in-depth qualitative case studies of seven LHD programs. A formal process informed the selection of the case studies. This process involved defining explicit selection criteria that related to location and performance against selected program functions. Each LHD program manager was invited to rate their program against each of the core functions. This was supplemented by ratings from the Ministry of Health, ACI, GPNSW and the Evaluation Team. The results were discussed by the Evaluation Team and six LHDs were selected to ensure a spread across both metropolitan and rural areas, and that represented differences in implementation. An additional LHD was selected to pilot the process. This pilot involved an interview with the program manager and a one-day site visit. The results from the pilot were included in the findings.

Data collection involved an initial 2-hour telephone interview with the program manager in each site. This was supplemented by a 3-day site visit and a series of semi-structured interviews with a range of people involved in the Program including dedicated program funded staff, managers and staff from other chronic disease management related programs, health care professionals and MLs. In some LHDs interviews were organised with GPs, medical specialists, consumer representatives and other key stakeholder groups and organisations.

More detail on findings of the in-depth case studies can be found in Appendix 5.1.

**Final high level scan**

The final scan involved two on-line surveys: one with all LHDs and one with all NSW MLs (excluding one ML whose geographic area is mostly in Victoria) [See Appendix 5.2 for copies of the two survey tools]. Supplementary telephone interviews were held with the program manager in each LHD. The response rate for the LHD survey was 100% and for the ML survey was over 80% (n=14).

The surveys focused on identifying and describing the program and models that are being implemented, and the elements that make up the model of care and the supporting service and governance arrangements. Both surveys included a mix of open and Likert scale responses. The LHD Survey contained 67 questions and the ML Survey was shorter and included 31 questions. The LHD survey was completed by the program manager who...
could involve other staff in its completion as they saw fit. The ML Survey was completed by the person most suitable, for example the CEO or senior managers.

Following completion of the survey by each LHD a short follow up telephone interview was conducted. The purpose was to clarify any of the survey responses and to explore the program managers’ experiences of, and satisfaction with, the Program.

2.2.2 Health service utilisation data collection

The Chronic Disease Management Program Minimum Data Set

The Minimum Data Set (MDS) created the central collection of data on people enrolled on the NSW CDMP to make it possible to track Program roll out and the characteristics of the participants. Further to this, the CDMP MDS is critical for the monitoring of the performance of the Program from an administrative, resource management and evaluation perspective. The MDS submitted by the LHDs on a quarterly basis to the Ministry of Health includes personally identifying information for participants and other identifying information (for linkage with hospital data), as well as data on key program and participant demographic elements. A full set of the variables released to the Evaluation from the CDMP MDS can be found at Appendix 5.3.

The CDMP Outcomes Register

The CDMP Outcomes Register (CDMP OR) was established in late 2013 under the Public Health and Disease Registers provisions of the Public Health Act to facilitate the measurement and monitoring of outcomes of the CDMP. It is the mechanism through which the Evaluation Team accessed a linked dataset for the Evaluation (for both CDMP participants registered on the MDS and for the control cohort of individuals eligible for but not on the Program).

The Register contains linked records from the following sources:

vii) all records of the NSW CDMP held by NSW Health and MLs;

viii) all records of participants on the Healthways coaching program, held by Healthways Australia;

ix) records of the NSW Admitted Patient Data Collection (public hospitals) and NSW Private Hospital Inpatient Statistics Collection, held by the Ministry of Health, for the period 1 January 2007 onwards that link to (i) or (ii) and all records relating to the following conditions:

- Chronic Obstructive Pulmonary Disease
- Coronary Artery Disease
- Hypertensive Diseases
- Congestive Heart Failure
- Diabetes

x) records of the NSW Emergency Department Data Collection, held by the Ministry of Health, for the period 1 January 2007 onwards that link to (i) or (ii);

xi) NSW Registry of Births, Deaths and Marriages Death Registrations, held by the Registry of Births, Deaths and Marriages and the Ministry of Health, for the period 1 January 2007 onwards that link to (i) or (ii); and

xii) all variables in the data collections listed in (i) – (v) excluding identifying particulars.
The full list of data variables in the de-identified linked dataset provided to the Evaluation Team are provided in Appendix 5.4. A brief overview of each dataset included in the CDMP Outcomes Register is shown below. In brief:

- **The Chronic Disease Management Program Minimum Data Set**
  
  - The MDS created the central collection of data on people enrolled on the NSW CDMP to make it possible to track Program roll out and the characteristics of participants. The MDS submitted by LHDs to the Ministry of Health includes personally identifying information for participants and other identifying information (for linkage with hospital data), as well as data on key program and participant demographic elements.

- **The NSW Admitted Patient Data Collection (APDC)**
  
  - The APDC includes all hospital separations (including discharges, transfers and deaths) from all NSW public and private hospitals and day procedure centres.

- **The NSW Emergency Department Data Collection (EDDC)**
  
  - The EDDC contains information on the majority (>80%) of NSW Emergency Department presentations (public hospitals).

- **The NSW Registry of Births, Deaths and Marriages (RBDM)**
  
  - The RBDM includes information on deaths occurring in NSW.

For the purposes of the Evaluation, the CDMP OR includes program participants for whom linked service utilisation data were available in the following categories as described in Figure 4:

i. All program participants registered in the MDS as at December 2013 (n=46,518) across 15 LHDs;

ii. All program participants registered in the MDS with a derived enrolment date\(^{72}\) as at December 2013 (n=43,847); and

iii. All program participants registered in the MDS with a derived enrolment date from January 2011 to December 2013 (n=41,303), which is the Evaluation cohort.

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\(^{72}\) A derived enrolment date was needed for the purposes of the analysis and was defined as follows: derived from Program consent date but if this data was not available then enrolment date. If enrolment date was not available then registration date was used.
Category iii) will be the cohort for analysis reported in this Final Report of the Evaluation.

**Telephone coaching data collection – a part of the CDMP Outcomes Register**

- A cohort of CDMP participants were referred to Healthways external telephone coaching between July 2012 and December 2013 (n=1530);
- Of the 1530 Healthways participants all but one linked to the CDMP MDS (n=1529); and
- The 1529 Healthways participants registered in the CDMP MDS were included in the data linkage completed by the Centre for Health Record Linkage (CHeReL) and is included in the 46,518.

**Data linkage through the mechanism of the CDMP Outcomes Register**

- The protocol for obtaining a cohort of program participants for linkage and release to the Evaluation was led by the Ministry of Health and determined by the parameters of the approved ethical framework for the Evaluation. This cohort were enrolled to the Program and registered on the MDS as at December 2013.
- The data linkage component of the Evaluation was administered through the newly created public health register - the CDMP OR - which allows for de-identified data linkage without the need for individual consent.
- The NSW Ministry of Health Centre for Epidemiology and Evidence compiled the raw utilisation data for a total of 46,518 program participants registered on the MDS (including 1529 Healthways participants) in the designated linkage period.
- The APDC data custodian provided a subset of records for persons hospitalised for one of the five CDMP target conditions. Records in this subset which did not link to the CDMP MDS dataset formed the potential control cohort, for the purposes of statistical analysis.
- Probabilistic linkage was carried out by the CHeReL, using their robust means of confidentially linking data with expected false positive and negative rates of less than 0.5%.  

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De-identified data released to the Evaluation Team

Participants registered on the CDMP MDS

The final de-identified data released to the Evaluation via the mechanism of the CDMP OR comprised the following records for the period of 1 January 2007 to 31 December 2013 relating to the participants registered on the CDMP MDS (including Healthways participants) to December 2013:

- 70,172 records for 46,519 persons
- Admitted episodes for 44,148 persons
- Emergency presentations for 42,607 persons
- 7,111 deaths

Control cohort

The final de-identified data released to the Evaluation via the mechanism of the CDMP OR comprised the following records for the period of 1 January 2007 to 31 December 2013 relating to the Control cohort:

- 1,529,563 records for 623,058 persons (Total APDC target condition Control records)
- 1,229,192 records for 501,775 persons (Control cohort linked to other APDC records)
- 1,386,095 records for 537,649 persons (Control cohort linked to EDDC records)
- 550,144 records for 173,329 persons (Control cohort linked to RBDM deaths)
- 31,657 records for 23,448 persons (Unlinked Control cohort ie no links to other APDC, EDDC or RBDM deaths)

2.2.3 Data collection for evaluation of additional benefit to Aboriginal people

Program data collection

As noted above in Section 2.2.2, the MDS created the central collection of data on people enrolled on the CDMP to make it possible to track program roll out and the characteristics of all participants, including Aboriginal participants. As such, the CDMP MDS underpins the Evaluation for Aboriginal people (with categories of program participants in the MDS as outlined above).

Process data collection

The process evaluation of the Aboriginal component of the Evaluation built on the process evaluation component of the broader State-wide CDMP Evaluation and involved:

- In-depth qualitative case studies of three LHD programs
- Interviews of patients on the CDMP
- A survey of Aboriginal Community Controlled Health Services (ACCHSs) in NSW

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74 This count includes one Healthways participant who was not linked to the CDMP MDS and therefore not included in subsequent analysis.

75 1787 persons remained unlinked. This is in line with expected rates of non-linkage for CHReL linkage.
Data from these three components were used and findings are based on an analysis of data from three major sources:

- Semi-structured interviews of health service providers and managers in the 3 intensive case study sites
- Semi-structured interviews of Aboriginal patients in each of the case study sites
- Data collected in the survey of ACCHSs in NSW

Additional data sources included population health information produced by Health Statistics, NSW.

**Choosing intensive case study sites**

The Evaluation Team sought advice from key stakeholders regarding case study sites – from the ACI, the Ministry of Health, and from members of the Evaluation Steering Group and other collaborators within the Evaluation Team. The criteria for selection of case study sites were as follows:

- LHDs with a well-developed and functioning CDMP
- LHDs providing complete and good quality quantitative data to the Evaluation
- LHDs located across a range of metropolitan, regional and remote locations
- LHDs with a large Aboriginal population

**Data collection**

Data collection for the intensive case studies occurred during a 2-3 day site visit to each of the study sites in late 2013 or early 2014 and involved a series of semi-structured interviews with a range of health service providers and managers involved in the care and management of Aboriginal people on the Program. The individuals interviewed included dedicated program staff, managers and staff from other chronic disease management related programs, health care professionals, ML staff and staff from ACCHSs with interest and capacity to be involved in the case study site visits.

Data collection for the patient interviews occurred either during or after the case study site visits and involved semi-structured interviews over the phone with patients enrolled to the Program in the case study sites.

The survey of ACCHSs in NSW was administered to all ACCHSs in NSW using Survey-Monkey and data collected electronically using Survey-Monkey.

**2.3 Analysis**

**2.3.1 Process evaluation**

**Initial high level scan**

There were 12 programs operating as at December 2011, 5 metropolitan and 7 rural. Three of these covered six metropolitan LHDs. Summary quantitative and qualitative data was entered into spreadsheets for analysis. Spreadsheets were developed for each major aspect of the Program and data was entered for each program/LHD. Summary profiles for each program were compiled and emailed back to participants for review and corrections. Responses were received for eight of the twelve programs, i.e. a response rate of 67%.

**In depth case studies**

Data was entered into spreadsheets in a summary form for thematic analysis within and across program domain areas. Cross-case comparisons were undertaken to identify similarities, differences and patterns in implementation. Descriptive summaries for each LHD were developed and provided to each program manager.
for their comment and internal use. LHDs provided feedback, and this process helped to ensure any factual errors in the analysis were corrected.

**Final high level scan**

Data was entered into spreadsheets for analysis. Several types of analyses were undertaken:

- Program level analysis: For questions related to each program element, the total number of LHDs responding to each response category was summarised;
- LHD analysis: Medians or modes were calculated for each relevant question and each LHD was allocated a score according to whether they were above, on, or below the median/mode; and
- A mix of content and thematic analysis was undertaken for the qualitative data.
- A similar type of analysis was undertaken for the ML data.

### 2.3.2 Evaluation of added benefit for Aboriginal people

**Health service utilisation data**

Health service utilisation of Aboriginal CDMP participants was analysed according to the methodology outlined in Sections 2.3.3 Service Utilisation and Section 2.3.5 Analysis approach below.

**Process data**

*Interviews of health service providers and managers*

The experience of health service providers and managers was obtained qualitatively, using key informant methodology. Interviews were conducted with a range of stakeholders from the LHD, MLs and ACCHSs who are actively involved in the care and management of Aboriginal people with chronic disease. The Evaluation Team conducted face-to-face interviews where possible, but held phone interviews where face-to-face interviews were not possible.

*Interviews of patients*

The experience of patients on the Program was also obtained qualitatively – using a semi-structured interview format. Interviews were conducted with a convenience sample of Aboriginal patients who had agreed to be contacted by the Evaluation Team to be interviewed about the Program and the care and management of their chronic condition.

*Survey of ACCHSs in NSW*

The survey of ACCHSs was administered to all organisations in NSW operational in late 2013 using SurveyMonkey and data collected electronically using SurveyMonkey. The survey was administered 3 times electronically, and non-responders were followed up by phone 2 times to encourage completion of the survey.

*Analysis of interview data*

All interviews with health care providers and managers were digitally recorded. The majority of interviews were uploaded to a central repository and transcribed verbatim. The remaining interviews were not transcribed verbatim and were listened to and detailed notes made. Transcripts were imported into NVivo, version 10 (QSR International, Melbourne, Victoria). Data was analysed using an inductive approach.  

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Analysis of patient interviews

All patient interviews were digitally recorded and detailed notes were made about each interview by two researchers. Data was coded and categorised to identify themes.

Analysis of survey data

Survey responses were collated using Survey-Monkey tools and the data was reviewed and cleaned prior to analysis. Data was analysed descriptively exploring qualitative responses in conjunction with quantitative responses.

2.3.3 Service utilisation

The primary focus of the statistical analyses was on the rate of potentially preventable hospitalisations (primary outcome), readmissions and emergency department presentations as well as hospital bed days associated with in-patient episodes.

Rates of potentially preventable hospitalisation were the focus of the analysis. Potentially preventable hospitalisations are defined as hospitalisations that fall under any of the categories in Table 2 below.

Frequency and nature of re-admissions were considered. Hospital re-admissions are defined as any hospital admission occurring less than 28 days after discharge from a previous in-patient episode. Like all admitted episodes, these can further be classified as potentially preventable or not.

The number of hospital bed-days for all in-patient episodes was analysed. Total bed days, as well as bed days associated with different in-patient episode types (for example, admission or re-admission) was also considered.

Hospital diagnoses were analysed using International Classification of Diseases version 10-Australian modification (ICD10-AM) codes pertaining to hospitalisation for ambulatory care sensitive conditions. These codes are used to identify potentially preventable hospitalisations and are shown in Table 2 below:

Table 2 ICD codes and additional selection information for potentially preventable hospitalisations: hospital admissions resulting from ambulatory care sensitive conditions

<table>
<thead>
<tr>
<th>Category</th>
<th>ICD-10-AM (2nd edition) codes</th>
<th>Additional selection information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine-preventable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza and pneumonia</td>
<td>J10, J11, J13, J14, J15.3, J15.4, J15.7, J15.9, J16.8, J18.1, J18.8</td>
<td>In any diagnosis field; exclude people under 2 months; ICD-10-AM: exclude cases with secondary diagnosis of D57</td>
</tr>
<tr>
<td>Other vaccine preventable</td>
<td>A35, A36, A37, A80, B05, B06, B16.1, B16.9, B18.0, B18.1, B26, G00.0, M01.4</td>
<td>In any diagnosis field</td>
</tr>
<tr>
<td>Chronic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes complications</td>
<td>E10.1-E10.8, E11.0-E11.8, E13.0-E13.8, E14.0-E14.8</td>
<td>In any diagnosis field</td>
</tr>
<tr>
<td>Nutritional deficiencies</td>
<td>E40-E43, E55.0, E64.3</td>
<td>Principal diagnosis only</td>
</tr>
<tr>
<td>Iron deficiency anaemia</td>
<td>D50.1-D50.9</td>
<td>Principal diagnosis only</td>
</tr>
<tr>
<td>Hypertension</td>
<td>I10, I11.9</td>
<td>Principal diagnosis only</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>I11.0, I50, J81</td>
<td>Principal diagnosis only; ICD-10-AM: exclude cases with procedures in blocks 600-693, 705-707, 717 and procedure codes 38721-00, 38721-01, 90226-00</td>
</tr>
<tr>
<td>Condition</td>
<td>ICD Codes</td>
<td>Diagnosis Notes</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Angina</td>
<td>I20, I24.0, I24.8, I24.9</td>
<td>Principal diagnosis only; ICD-10-AM: exclude cases with procedure codes in blocks 1-1779</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>J41-J44, J47, (J20)</td>
<td>Principal diagnosis only; ICD-10-AM: J20 only with second diagnosis of J41, J42, J43, J44, J47</td>
</tr>
<tr>
<td>Asthma</td>
<td>J45, J46</td>
<td>Principal diagnosis only</td>
</tr>
</tbody>
</table>

**Acute**

- Dehydration and gastroenteritis
  - E86, K52.2, K52.8, K52.9
  - Principal diagnosis only

- Convulsions and epilepsy
  - G40, G41, O15, R56
  - Principal diagnosis only

- Ear, nose and throat infections
  - H66, H67, J02, J03, J06, J31.2
  - Principal diagnosis only

- Dental conditions
  - A69.0, K02-K06, K08, K09.8, K09.9, K12, K13
  - Principal diagnosis only

- Perforated/bleeding ulcer
  - K25.0-K25.2, K25.4-K25.6, K26.0-K26.2, K26.4-K26.6, K27.0-K27.2, K27.4-K27.6, K28.0-K28.2, K28.4-K28.6
  - Principal diagnosis only

- Ruptured appendix
  - K35.0
  - In any diagnosis field

- Pyelonephritis
  - N10, N11, N12, N13.6
  - Principal diagnosis only

- Pelvic inflammatory disease
  - N70, N73, N74
  - Principal diagnosis only

- Cellulitis
  - L03, L04, L08.0, L08.8, L08.9, L88, L98.0, L98.3
  - ICD-10-AM: Include cases where L03, L04, L08.0, L08.8, L08.9, L88, L98.0, L98.3 is reported as the principal diagnosis AND there were either no procedures reported OR the procedures listed were only in blocks 1604-1606, 1608, 1820-2016 or the procedures 90660-00, 30207-00, 30676-00, 30679-00, 34530-01 and 47912-00. Additionally, check that the procedure is the only procedure when in the list: blocks 1604-1606, 1608, or the procedures are: 90660-00, 30207-00, 30676-00, 30679-00, 34530-01 and 47912-00 |

- Gangrene
  - R02
  - In any diagnosis field

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Note: This list is based on the Australian work by Vic DHS and subsequent development by NSW Health: the method of simplifying the procedure exclusions in ICD-10 by the use of procedure code blocks was developed by NSW Health.

Similarly unplanned hospitalisations were defined as hospital admissions fulfilling the following criteria:

1. Emergency status is ‘1’, i.e. “Emergency”.
2. The mode of separation is not ‘11’, i.e. “Transfer to Palliative Care Unit / Hospice”.
3. Does not have any secondary diagnoses as “(Z51.5) Palliative care”.

We note that during this period, in July 2010, the Australian Coding Standard for diabetes was revised resulting in a major change affecting the coding of diabetes as a principal diagnosis or an additional diagnosis (or comorbidity) in the hospital data. This change is responsible for the dramatic decrease in the number and rate of hospitalisation for diabetes as a principal diagnosis in NSW between 2009-10 and 2010-11 (around a 60% decrease).77

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2.3.4 Economic parameters

The key variable of interest for analysis of costs associated with the Program would, in principle, be the NWAU which expresses the National Efficient Price of any given service event as a single unit. IHPA calculates the National Efficient Price for federal activity-based funding of state-run hospital services.

An NWAU value is assigned to any given hospitalisation (including unplanned and potentially preventable hospitalisations, and re-admissions) or emergency department presentation. NWAUs are additive and therefore can be used to calculate the cost of hospital service utilisation in any given period for an individual or cohort.

There are a number of NWAU variables available for the purposes of analysis:

- NWAU Base – The National Admitted Weighted Unit (NWAU) for an inpatient episode/ED visit/non admitted service event, generated using the classification and price weights for the relevant ABF stream (Acute admitted, subacute, ED, outpatient/community health), prior to any subsequent adjustments (eg, prior to the application of the Aboriginal adjustment and so on);
- NWAU Final – The final National Admitted Weighted Unit (NWAU) for an inpatient episode/ED visit/non admitted service event, generated using the classification and price weights for the relevant ABF stream, after the assignment of further adjustments;
- NWAU Equiv – The National Admitted Weighted Unit (NWAU) for an acute admitted patient episode, generated using the classification and price weights for the Acute Admitted ABF stream, after the assignment of further adjustments, but excluding the private patient adjustments; and
- NWAU Version – The version of the ABF framework which defines the scope, classifications and adjustment factors that are in use for the calculation of the various National Weighted Activity Units (NWAUs) for a given reporting period. These have been described using the year in which the version is active; that is, NWAU(12) is the version of the NWAU applicable for the 12/13 financial year, NWAU(13) for 13/14, and so on.

After consultation with the Health Systems Information and Performance Reporting branch of the Ministry of Health it was agreed the Evaluation Team would use the NWAU Base variable for the analysis of costs associated with the Program.

At the time of preparation of this report, NWAU information in the CDMP OR was incomplete, reflecting the backlog of coding at the Ministry of Health. Accordingly, analysis as intended for the Evaluation was not possible, but is anticipated as being undertaken when the data become available through the Agency for Clinical Innovation.

2.3.5 Analysis methods

Case selection

Evaluation cohort

The primary analysis set consisted of all CDMP patients enrolled between January 2011 (Month 1) and December 2013 (Month 35). A valid enrolment date was crucial to being able to undertake analysis of program impact. A parsimonious approach to derive an appropriate enrolment data for as many participants as possible was used. Program consent date when available, was used as the enrolment date. If missing, the Enrolment decision date was used, if available. If both were unavailable, the Registration date was used as the enrolment date instead. Only those participants for whom a valid enrolment date between January 2011 and December 2013 are included in the analysis as the “Evaluation cohort”.

Multivariate cohort

Multivariate and matched analyses were further restricted to the “Multivariate cohort” defined as those enrolled between January 2011 (Month 1) and November 2013 (Month 35) and who had at least one hospital admission or ED presentation in the 12 months preceding their enrolment into the Program. For each month
between Month 1 and Month 35, any person never enrolled in CDMP and who had had at least one hospital admission or ED presentation in the 12 months preceding the month was considered a potential control.

Patients from very small LHDs or with an invalid LHD code were excluded (LHD codes X170, X180, X630, X860 and X921).

Outcomes

Measures of service utilisation were analysed as yearly rates and derived as the number of events collected between the month of enrolment and November 2013 divided by the number of years corresponding to that observation period (exposure). To separate the effect of death from the effect of exposure, analyses of service utilisation were only performed in survivors, i.e. patients from the CDMP and Control cohorts who were still alive by November 2013. Service utilisation outcomes included:

- Yearly rate of potentially preventable hospital admissions (primary)
- Yearly rate of unplanned hospital admissions
- Yearly rate of emergency department (ED) presentations
- Yearly rate of potentially preventable readmissions
- Yearly rate of unplanned readmissions
- Yearly average of potentially preventable bed-days
- Yearly average of unplanned bed-days
- Yearly average of NWAUs

The effect of the Program on all-cause death was analysed separately.

Statistical analyses

Descriptive analyses

Crude death counts and monthly rates of service utilisation per month were described for the entire CDMP Evaluation cohort and the entire potential control cohort between January 2007 and November 2013. Additionally, for the CDMP cohort, detailed socio-demographic characteristics and measures of service utilisation were tabulated by year of enrolment.

Establishment of baseline for multivariate analyses

Baseline characteristics were obtained using the data collected at the time of hospitalisations and ED presentations occurring in the last 12 months. Characteristics included socio-demographic characteristics collected at the time of the most recent hospitalisation (age, sex, marital status, Aboriginal status, LHD, SEIFA) and a set of variables summarising medical history and service utilisation in the 12 months preceding enrolment (number of co-morbidities, number of unplanned hospital admissions, number of potentially preventable hospital admissions, number of ED presentations, history of ED presentation in triage category 1 (resuscitation), history of ED presentation in triage category 2 (emergency), history of ED presentation in triage category 3 (urgent), history of ED presentation in triage category 4 (semi-urgent), history of ED presentation in triage category 5 (non-urgent), hospitalisation including diagnosis of COPD, hospitalisation including diagnosis of CAD, hospitalisation including diagnosis of hypertension, hospitalisation including diagnosis of CHF, hospitalisation including diagnosis of diabetes, history of cardiovascular disease, history of cerebrovascular disease, history of respiratory disease, history of renal disease, history of dementia, history of obesity and history of smoking).

Propensity scoring and matching

All baseline variables and their 2-way interactions were included as candidates in a multiple regression with automatic forward selection. The outcome was a binary variable indicative of CDMP enrolment. A separate model was derived for every month of enrolment with a propensity score (the probability of CDMP enrolment) was calculated based on the final model selected by the procedure. The distribution of propensity scores in the CDMP and Control cohorts was analysed using histograms.
Each CDMP patient was matched to one control using 1:1 greedy matching based on the propensity score and using a calliper of 0.02 (i.e. the propensity score of a CDMP participant and its control had to be within 0.02 of each other) which is small enough to avoid important differences while allowing most cases to be matched. The matching procedure started with CDMP patients enrolled in January 2011 (Month 1), then with those enrolled in Month 2, Month 3, etc. until Month 35. A control matched in an early month was excluded from the matching pool for future months. The quality of the matching was assessed by plotting the distribution of propensity scores in each cohort after matching and by comparing pre-enrolment characteristics using cumulative distribution functions and standardised differences.

We constructed a matched control cohort at person level. This technique is often used in clinical observational studies. There are several methods for constructing a control cohort, but the aim is always for the control cohort to have the same distribution of relevant characteristics as the intervention cohort in the time period prior to the start of the intervention. Two main methods include:

- Deriving a propensity score. This score summarises as a single figure those characteristics that reflect the likelihood that a given person received the intervention. A control cohort is then determined by selecting people with similar propensity scores to those in the intervention cohort.
- Matching according to a prognostic score. The prognostic score is a summary of the characteristics relevant to determining whether someone would experience the outcome event of interest, in the absence of the intervention.

Both methods (propensity score and prognostic score) are likely to lead to similar matching. An advantage of propensity score methods is that the modelling of the enrolment mechanism is completely separate from the modelling of outcomes, thus reproducing the approach used in a randomised trial. Variables thought to be related to outcomes were used both in the propensity score calculation and as covariates when modelling the effect of the Program on outcomes.

**Matched analyses**

Bar plots showing the mean average yearly rate of utilisation between enrolment and November 2013 and 95% confidence interval by month of enrolment and cohort were created.

Longitudinal plots showing the average rate of utilisation by month were created. For those plots, month was defined as time from enrolment with negative months corresponding to time preceding enrolment (minimum - 83 for those enrolled in November 2013) and positive months to time post-enrolment (maximum 35 for those enrolled in January 2011).

Matched utilisation data were further analysed using linear models with generalised estimating equations accounting for the correlation within matched pairs. Outcomes were individual yearly rates of utilisations (for example: yearly rate of potentially preventable hospitalisation). Covariates included the effect of the Program (CDMP vs Control), the month of enrolment (1 to 34) and a time-by-program interaction. In addition, models included key baseline characteristics (Indigenous status, age, previous number of unplanned hospitalisations, previous number of unplanned hospitalisations and previous number of ED admissions) as well as the propensity score itself. Although all those variables were already included in the propensity score model, this ensures that we adjust for small residual covariate imbalance between the cohorts following the principle of “double robustness.”

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Analysis of Healthways

The effect of the Healthways intervention was analysed similarly to the overall effect of program enrolment. However, rather than using program enrolment as the ‘enrolment date’, the beginning of participation in the Healthways intervention was used. A separate matched set was therefore created for those patients – that is, a matched CDMP Healthways cohort and a Control cohort. To enable us to directly compare Healthways participants to other CDMP participants post-hoc analyses were also conducted where the controls were selected from other CDMP participants who were never enrolled into the Healthways intervention.

Stratified and subgroup analyses

The effect of CDMP was separately analysed in five subsets including a separate analysis in Aboriginal participants, and separate analyses for each LHD with a focus on the four biggest LHDs (Hunter New England, Illawarra Shoalhaven, Western Sydney and South-East Sydney). For each subgroup, a separate matching process was implemented, limiting candidates to patients from the relevant subgroup (e.g. only Aboriginal patients were matched to Aboriginal patients with the same propensity score).

If a patient was reported as Aboriginal or Torres Strait Islander in at least one hospital and ED admission record, (s)he was considered Aboriginal for the purpose of our analyses including adjustment, matching and analyses by Aboriginal subgroups. Alternative ways of deriving Aboriginal status were tested and overlapped considerably with our primary definition.

Post-hoc subgroup analyses were performed on the primary endpoint (yearly rate of potentially preventable hospitalisations) by individually testing the interaction term between each subgroup variable and the effect of the CDMP. Subgroups included propensity score (quintiles), gender, age (in 7 categories), LHD (grouped by Area Health Service), Aboriginal status, ARIA (4 categories), number of potentially preventable hospitalisation in last 12 months (3 categories), number of unplanned admissions in last 12 months (4 categories), number of hospital admissions in last 12 months (5 categories), number of ED presentations in last 12 months (4 categories) and each target condition.

Sensitivity analyses

Sensitivity analyses included the use of a 2-year baseline instead of 1-year, that is considering patients who had at least one hospital or ED admission in the 2 years preceding their enrolment. We also tested Poisson models to directly analyse counts with appropriate exposure adjustments (offsets) instead of linear modelling of individual yearly rates.

Statistical significance

In general convention, the level of statistical significance is set at p <0.05. However, when group numbers are very large, and/ or the numbers of statistical comparisons are many, the opportunity for overestimating the importance of effects needs to be considered. The usual practice is to consider more stringent p values, for example those where p<0.001 as being more appropriate indicators of important effects. In the analyses that follow, a distinction is made between effects that are considered borderline (i.e around p <0.05) and those that are more robust (p<0.001).
3 Findings

This section begins by describing the development of the Program over the period of the Evaluation, and the main challenges LHDs and their partners faced in implementing the Program within their areas. This is followed by a summary of key aspects of programs as they were operating at the time of the final scan in early 2014, and a description of some of the correlations between different program characteristics.

3.1 Program development

This section summarises how the Program developed between the three main points of data collection of the process evaluation. Table 3 shows the evolution of systems that support the Program, the model of care, program monitoring, and the focus on disadvantaged groups.

Table 3 Summary of achievements and developments

<table>
<thead>
<tr>
<th>Area of focus</th>
<th>Initial Scan: Dec 2011</th>
<th>Case Studies: Feb-April 2013</th>
<th>Final scan April 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems for identifying &amp; managing enrolments</td>
<td>Most focus on identifying and enrolling patients from hospital presentations</td>
<td>Some well-functioning and centralised single point of contact (contact centres) More LHDs with real time identification systems</td>
<td>More than half the LHDs (predominantly metropolitan) have established intake centres for identifying and managing enrolled patients</td>
</tr>
<tr>
<td>Systems for sharing information</td>
<td>Focus on upgrading CHIME and extend use of ARGUS</td>
<td>Improved access and functioning of CHIME and ARGUS Used for coordination less by service providers than program staff</td>
<td>Information systems only fully support the Program in 4 LHDs, and partly support in a further 7 LHDs</td>
</tr>
<tr>
<td>Systems for integration with other chronic disease management programs/services</td>
<td>Early beginnings</td>
<td>Some co-location of 48 Hour Follow Up staff with program staff Progress on referral pathways between rehabilitation services to Program</td>
<td>More than half the LHDs have integrated intake arrangements between CDMP and 48 Hour Follow Up; but in just over 25% of LHDs a significant proportion of eligible Aboriginal patients are referred to CDMP. More than 25% of patients referred from chronic disease related rehabilitation programs in only a few LHDs.</td>
</tr>
<tr>
<td>Model of care</td>
<td>1-2 streams developed: Initial focus on care coordination Early days for implementing health coaching stream</td>
<td>Progress on implementing health coaching Some differentiation of levels of care coordination based on need</td>
<td>4 LHDs have well established arrangements for providing telephone support for at least 50% of enrolled patients. Significant differences between LHDs in proportion of patients receiving predominantly face to face care</td>
</tr>
<tr>
<td>Program monitoring and evaluation</td>
<td>Little progress</td>
<td>Little systematic program monitoring or evaluation Some progress on embedding MDS in CHIME Some LHDs still using manual spread sheets</td>
<td>Significant improvement with systems in place for monitoring progress of patients across the Program in most LHDs; and 2/3rds monitoring reach within eligible population at least in part.</td>
</tr>
<tr>
<td>Focus on disadvantaged groups</td>
<td>Early days</td>
<td>Most progress in Aboriginal health Beginning focus in some LHDs on people with mental health comorbidities, rural access to rehabilitation services, self-management support for specific CALD groups</td>
<td>Greater effort on this area, with a range of approaches being used for several groups: Aboriginal people, clients with mental health conditions, and those from CALD background.</td>
</tr>
</tbody>
</table>

At the start of the Program, there was a strong concern with enrolling individual patients to meet targets. As the Program developed it gradually shifted towards a focus on the eligible patient population. More consistent approaches to intake and comprehensive assessment were adopted, and some systems for monitoring progress and reach at a program level were established. Over this period, links with other programs – for...
example existing rehabilitation programs – were strengthened and models of care became more comprehensive: thus a number of LHDs expanded their use of telephone support and were now using it as a stand-alone intervention, as a supplement to face to face care or as a way of maintaining low-level contact when people no longer need higher levels of support. These developments were supported by improvements in systems supporting the Program – for example establishing single points of contact, strengthening systems for sharing information, and standardising tools for assessment. There was initially only a limited focus on involving disadvantaged groups in the Program. This developed first around the needs of Aboriginal people, including strengthening links with Aboriginal specific programs. Towards the end of the Evaluation, most programs had developed a broader approach to this issue.

Challenges

LHDs faced significant challenges in taking on such a large program. Here these are grouped into themes: building on pre-existing relationships, particularly when these were not strong; organisational and cultural change; integrating the Program with existing services; recruitment and retention of staff; and systems for communication and information sharing.

Pre-existing relationships between LHDs and MLs influenced how they worked together, and the way the Program developed. At the start of the Program MLs were still establishing themselves, and in many cases were forming relationships with LHDs. This provided an uncertain environment in which to design and establish their local CDMP. Early decisions could be important: for example the choice of whether care coordinators were located in LHDs, MLs or both greatly influenced the shape the Program took. In general, LHDs which took account of the perspectives of MLs were more successful in engaging them. However even here, engagement with GP remained low, perhaps because the Program was designed around problems arising in the acute care sector (high rates of hospitalisation) rather than the concerns GPs might have about managing patients with complex care needs.

The Program was implemented during a time of significant organisational change: nationally with the establishment of MLs, and at state level with the creation of LHDs and the move from a Department to a Ministry of Health. In this shifting environment arrangements and responsibilities were sometimes unclear, and senior leadership had many calls on their attention. This may have influenced the time taken to resolve some problems in the design and implementation of the Program. Some program managers experienced this as a hindrance; for others it provided opportunities to develop local solutions that met their particular needs.

The Program was not established in a vacuum: there were already services for people with chronic conditions, and clinicians who were providing elements of care planning and coordination. This sometimes made it difficult to negotiate the particular role of the CDMP, or integrate it with existing services and programs. It often took time to establish the need for better care coordination, to identify gaps in care and have other services accept that the CDMP added value to what they offered, rather than competed with it. High level executive sponsorship of the Program was important to create the space within which these issues could be addressed and in which a new system of care could start to emerge. Good executive sponsors gave the Program visibility and safeguarded its integrity, funding and resources.

Early in the Program, recruitment and retention of staff was a particular challenge. It was sometimes difficult to recruit care coordinators with the requisite skills, staff freezes led to delays in recruitment and there were sometimes staff shortages in chronic care services. Over time some of these challenges were overcome. However rural LHDs in particular continued to report that it was difficult having few staff dedicated to the Program: staffing the Program with workers who already had existing caseloads reduced capacity and made it harder to establish the Program’s identity.

The Program relied on information and communication systems for identifying and recruiting people, sharing information and monitoring the Program. Existing systems were generally not up to the task, which hindered program development, the sharing of care and integration between services and sectors. Considerable progress was made during the course of the Program, particularly with systems for sharing information across LHD services and providing real time electronic flags for identifying patients who re-present to emergency departments or hospitals. However further work is needed to ensure that clinicians and services use this information consistently to provide more timely and integrated care.
3.1.1 Core features of Program models

This section presents an overview of the Program as it was operating across the LHDs at the time of the final scan in early 2014. Note that most people represented in the quantitative evaluation would have received much of their care at earlier stages of the Program, when it was less developed.

The findings are presented according to the major domains in the logic framework and the core features within each domain:

- Program governance, including governance structure and representation
- Collaborative and integrated service development and delivery, including infrastructure supports (the care coordinators, contact centres, decision support tools, systems for sharing information, clinical pathways, intake arrangements and systems for program monitoring and review), adapting the Program for vulnerable groups, and integration with Aboriginal related programs and services
- The model of care, including patient identification and comprehensive assessment, care planning and coordination, and the levels/types of care.

Table 4 summarises the core dimensions of programs as they emerged through the process evaluation, together with descriptors of how they manifested in different programs. They provide the basis for a functional description of a chronic disease management program in the discussion section.

<table>
<thead>
<tr>
<th>Domains</th>
<th>Dimensions and descriptors</th>
</tr>
</thead>
</table>
| History and context    | • Location: metropolitan/rural  
                        | • Relationship to previous chronic disease programs  
                        | • Previous relationships with intersectoral partners including primary care |
| Governance             | • Integration: managed as a separate program / in conjunction with other chronic disease programs  
                        | • Intersectoral: range of non-LHD organisations represented on governance committee (including MLs)  
                        | • Review: extent to which the program and its reach are monitored and reviewed |
| Collaboration model    | • Employment and location of care coordinators: LHD only, LHD and ML, ML only  
                        | • Orientation: extent to which assessment, planning and care coordination are undertaken by within the LHD or in primary care.  
                        | • Links to other programs, including Aboriginal health programs: range of programs and types of links |
| Model of care          | • Variety of referral sources: range of referral sources and proportion of referrals not from LHD hospitals  
                        | • Range of care options (e.g. levels of telephone support/coaching and care coordination)  
                        | • Intensity of intervention: proportion of patients receiving care coordination and/or telephone support |
| Infrastructure         | • Single/multiple intake and referral centres, with/out consistent approach, stand alone or integrated with other services  
                        | • Standard tools to support assessment and care coordination: whether used, and if validated  
                        | • Systems for information sharing: reach and adequacy. |

The following figures show data from the survey of LHDs, except where otherwise stated.
Program governance

Figure 5 Type of governance structure by LHD

In the majority of LHDs, governance for the Program was integrated with other chronic disease governance structures.

Figure 6 Groups represented on governance structure by LHD

A broad range of groups were represented on the governance structures for the Program. Community health services and program managers were the most common groups followed by the LHD executive. Aboriginal health, MLs and chronic disease specialist services were the next most common groups represented in 10-11 LHDs. GPs were represented in just under 50% of LHDs and ACCHS and consumers were the least represented groups.
MLs were represented on governance structures in all programs that had ML based care coordinators, and in most other programs. Where there were ML-based care coordinators, GPs were better represented on governance structures and more engaged in the Program.

Summary
The major differences were:

- Whether the governance structures were integrated (2/3rds) or stand-alone
- The breadth of LHD representation on governance structure: hospitals, specialist chronic disease services/programs and aged care services were not represented in at least 1/3rd of LHDs
- GP representation, with GPs directly represented in just under 50% of programs
- The presence of ML-based care coordinators which was associated with greater GP engagement and involvement in program management and greater ML contribution to decision-making.
- ACCHS and consumers were the least represented groups

Collaborative service development and delivery

Care coordinators

Figure 8 Location of care coordinators by LHD

Care coordinators were based exclusively in LHDs and in both LHDs and MLs in just less than 50% cases respectively. Only one program had coordinators based solely in MLs.
In most LHDs patient navigation\textsuperscript{81} accounted for 25% and more of LHD-based care coordinators’ time, with a similar proportion of time being devoted to phone support, and health coaching in a third of LHDs. Clinician support and GP liaison were a relatively minor role.

In the eight LHDs where they were based in the ML, care coordinators spent most time on patient navigation and referral support, and more than half the programs reported that they devoted more than 25% of time to patient navigation and phone support roles. Less than 6% of time was devoted to clinical care and, as with LHD-based care coordinators, liaison with ACCHSs was a minor part of their role.

Three of the rural LHDs with ML-based care coordinators reported sharing positions with the CCSS Program and in one ML, with a number of other roles.

\textsuperscript{81} This was not defined in the questionnaire.
In almost all programs with LHD and ML based care coordinators, more than half of these had received training in health coaching. 25% of LHDs reported this level of reach amongst community health staff. Rates were much lower in GP and with practice nurses.

Health coaching training was reported to be popular with staff: where staff outside of the LHD was trained (e.g. in the ML or in GP) this was perceived as a benefit from the CDMP.

In areas where there was high staff turn-over (including some rural areas), training needed to be repeated for new staff. When this was not possible, there was a loss of workforce capability in this area.

**Summary:**

*The major differences were:*

- The location of care coordinators, with an even split between having care coordinators based in both LHD and MLs and exclusively in the LHD.
- The difference in roles between LHD and ML-based care coordinators, the former spending a greater proportion of their time on patient navigation (25%) and phone support and coaching (25%), and the latter having a greater role in supporting referrals as well as providing patient navigation and phone support in some LHDs.
- Almost all care coordinators received training in health coaching.
Systems for sharing information

Figure 12 Systems for electronic sharing of information by LHD

All LHDs had systems in place for sharing information across the LHD, although in 40% this was only ‘in part’. 60% of LHDs had systems ‘in part’ for sharing information with GPs. The content of information shared varied, depending in part on the design of the Program. The adequacy of these systems also varied: in only four LHDs was it considered to fully support the Program (Figure 13).

Figure 13 Adequacy of LHD information systems by LHD
ML reports on information systems were fairly consistent with those of LHDs. More MLs reported having systems for sharing information with GPs (ML to GP) than in the reverse direction (GPs to MLs).

**Summary**

The major differences were:

- 2/3rd of LHDs had systems for sharing information with GPs, and 1/3rd which did not.
- LHD information systems were seen as fully supporting the Program in only 4 LHDs, and not supporting the Program at all in a further 4.

**Clinical pathways**

Some LHDs reported that the CDMP had been integrated into clinical pathways, and more noted that this was under development. In some cases the CDMP was integrated into clinical pathways that were oriented around services, particularly those relating to COPD, cardiac and diabetes and Aboriginal Health services. Elsewhere it was integrated into clinical pathways oriented towards particular staff teams, including community, aged and chronic care nurses.

Most LHDs that reported not having integrated the CDMP into clinical pathways were rural.

MLs were more likely to report the existence of clinical pathways than the LHDs.

**Intake arrangements**

**Figure 15 Intake arrangements by LHD**

Legend

A – A single intake centre/point using a consistent approach
B – Multiple intake centres/points using a consistent approach
C – Multiple intake centres/points NOT using a consistent approach
Nearly all LHDs had either a single or multiple intake centres/points, using a consistent approach.

**Figure 16 Roles of intake centres**

![Roles of intake centres chart]

Of the 14 LHDs who responded, many reported that their intake centres/points undertook all the specified roles. The main exception was enrolment, which was not included in over 1/3 of LHDs.

**Figure 17 Integration of intake with other intake arrangements by LHD**

![Integration of intake chart]

In nearly all LHDs where information was available (n=14) CDMP intake arrangements were fully or partly integrated with those for community health services. 60% had integrated arrangements for the 48 Hour Follow Up Program and fewer for aged care. Of the 7 LHDs which had a single intake centre, all were fully/partly integrated with community health services, five with the 48 Hour Follow Up Program, and 3 with aged care services.

**Summary**

The major differences were:

- Whether there was a single or multiple intake centres/points, with 50% of LHDs reporting a single intake centre.
- Those LHDs which had intake points, rather than intake centres, had less developed roles.
- Integration with other intake arrangements, which was more likely in those LHDs where there was a single intake centre.
Program monitoring and review

Figure 18 Systems for monitoring patient progress and reach of the Program by LHD

2/3rd of LHDs had systems in place partially or completely for monitoring reach of the Program among eligible patients, and just over half for reach in the eligible population. 80% of LHDs had systems in place for monitoring the progress of patients across the Program.

Summary

The major difference was:

- Whether LHDs had systems in place for monitoring the reach of the Program and progress of patients through the Program.

Integration with Aboriginal related programs and services

Figure 19 Estimated proportion of eligible Aboriginal patients referred from 48 Hour Follow Up Program by LHD

Only 25% of LHDs reported that more than half eligible Aboriginal patients were referred from the 48 Hour Follow Up Program to the CDMP.
In most programs, Aboriginal health services from the LHD were represented on the CDMP governance structures, but ACCHSs were represented in only a third.

Care coordinators spent a small proportion of their time on liaison with ACCHSs, whether they were based in LHDs or MLs.

Less than half the LHDs had systems for sharing information with ACCHS, and of these, most were only ‘in part’.
In more than half the LHDs, intake arrangements were integrated either fully or partly across the two programs.

**Summary**

The major differences were:

- Whether intake arrangements were integrated between the CDMP and the 48 Hour Follow Up Program
- Case conferences and joint case management were the most commonly reported arrangements for coordinating care for Aboriginal patients
- Care coordinators, regardless of whether they were located in the LHD or ML, spend a small proportion of their time on liaison with ACCHSs
- Less than half the LHDs had even systems for sharing information with ACCHSs
Model of care

Patient identification and comprehensive assessment

Figure 25 Source of patient referrals to the CDMP by LHD

Most referrals to the Program came from LHD hospitals. 1-2 LHDs reported getting more than half their referrals from other LHD services such as rehabilitation services and programs. There were fewer referrals from GP.

While eight MLs reported hardly any GP referrals, a further four reported ‘many’. Note that the five LHDs also reported more than 6% of referrals from GPs.

Summary

The major difference was:
- Source of referrals, with most LHDs receiving the majority of the referrals from LHD hospitals, a few with majority from sources other than their hospitals, and fewer from GP.

Figure 26 Approaches to comprehensive assessment by LHD

Almost all LHDs used single assessments or multiple assessments which had common elements. In some LHDs the Program undertook assessments for all patients, where in others they did so only for patients allocated to care coordination.
Most comprehensive assessments were undertaken by LHD-based care coordinators, with a more limited role for other LHD staff (between 6-45% of assessments in 1/3 of LHDs). Amongst the 8 LHDs with ML-based care coordinators, only one had the care coordinator who undertook more than half of the comprehensive assessments. Few GP staff undertook comprehensive assessments.

Care planning and coordination

In most LHDs, the majority of care coordination plans were developed by LHD-based care coordinators. ML care coordinators’ roles were evenly split: in three programs they develop most and in three hardly any plans. Again, with one exception, GP staff had little involvement.
LHD-based care coordinators coordinated the care of most patients in just over half the LHDs. The corresponding figure for ML-based care coordinators was 25%.

In over 2/3rds of LHDs, all or most community health, chronic disease services and aged care emergency teams were reported to have access to the care coordination plan. The majority of LHDs also reported that only some GPs could access the plan. In contrast 4 MLs (covering 4 LHDs) reported that many GPs could access the plan.

**Summary**
The major differences/approaches were:
- LHDs which undertook comprehensive assessments for all patients vs some patients (i.e. only those allocated to care coordination)
- Centralisation of comprehensive assessments, planning/compiling care coordination plans and coordinated the care in LHDs by care coordinators, irrespective of whether there were ML-based care coordinators
- Few GP staff undertook comprehensive assessments.
- In only 1-2 instances where there were ML-based care coordinators did they undertake 50% or more of these functions.
- In 2/3rds of LHDs GPs had only a minor role in care coordination
- GPs had minor role in assessment and planning and coordination
Levels of care

Figure 31 Patients receiving different levels of care by LHD

Most patients received telephone support only in 4 LHDs, and face to face care only a further 3. No LHDs had intensive case management as the main option, and only one limited rehabilitation in 2/3rds of LHDs between 6-49% of patients receive a mix of phone support and some face to face care.

Summary
The major differences were:
- The mixture of interventions in different LHDs. Telephone support played a significant role in most LHDs.

82 ‘Phone support’ was not defined in the survey.
Adapting the Program for vulnerable groups

LHDs were asked how they had adapted their program to meet the needs of vulnerable groups. Table 5 summarises their responses.

**Table 5 Approaches to improve access by vulnerable groups reported by LHDs**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Vulnerable group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-case management, case conferencing, and sharing care plans with service providers</td>
<td>Aboriginal, mental health (in development)</td>
</tr>
<tr>
<td>Staff training on working with vulnerable groups, including in-services at CDMP team meetings</td>
<td>Mental health, aged care</td>
</tr>
<tr>
<td>Linking CDMP with existing programs for vulnerable groups, including via referral pathways</td>
<td>Aboriginal (via the 48 Hour Follow Up Program and CCSS Program), aged care (via ASET), justice health (via referral pathways), homelessness health, mental health protocol (in development)</td>
</tr>
<tr>
<td>Hiring specialist staff with skills and experience working with vulnerable groups</td>
<td>Aboriginal (Aboriginal coordinator), aged care (funded geriatrician positions), CALD (use of health care interpreters)</td>
</tr>
<tr>
<td>Developing targeted education materials</td>
<td>CALD</td>
</tr>
<tr>
<td>Funding programs for vulnerable groups, including programs promoting self-management</td>
<td>CALD</td>
</tr>
<tr>
<td>Colocation and integration of CDMP positions with services oriented towards vulnerable groups</td>
<td>Aboriginal (48 Hour Follow Up staff), respiratory and heart failure Aboriginal (CDMP and 48 Hour Follow Up integrated position)</td>
</tr>
</tbody>
</table>

LHDs used a wide range of approaches, from education and training through selection of staff and dedicated funding to colocation of CDMP staff with services working with vulnerable groups. The major groups targeted were initially Aboriginal people, and more recently, clients with mental health conditions and people from culturally and linguistically diverse backgrounds (CALD).

### 3.1.2 Sub Analyses

In addition to analysing separate variables from the LHD and ML surveys, we combined items to create composite variables reflecting more complex aspects of program design and operation. These variables are listed below. Their construction, including the component variables from which they are derived, is described in more detail in Appendix 5.5. These complex variables were:

- **Primary care orientation**: the extent to which the Program was conducted through GP or the Medicare Local, rather than through the Local Health District.
- **LHD orientation**: the extent to which the Program was conducted within the LHD.
- **Use of telephone support (with or without some face to face contact)**: the proportion of patients receiving telephone support, alone or in conjunction with face to face care.
- **Capacity of information systems (GP and ML)**: the reach of and access to electronic information systems linking MLs with LHDs and GPs.
- **Capacity of information systems (LHD)**: the reach of systems across the LHD, access to and perceived adequacy of these systems.
- **Integration of CDMP intake arrangements with other intake arrangements**: integration with Aboriginal 48 hour follow up, community health and aged care intake arrangements.
- **Systematised**: the use of standard tools to support enrolment decisions and comprehensive assessments.
- **Monitoring and review**: systems for monitoring progress of patients within the CDMP, reviewing program reach amongst eligible patients and among the eligible population.

Programs were assigned a score for each composite variable by giving a sub-score score for each of their component variables (0 = below the median for that each component variable, 1= on the median and 2 = above
the median). These sub-scores were then averaged to create a score for the composite variable. A table of the composite scores is found in Appendix 5.6.

The radar graphs below show comparisons between groups of programs on these composite scores, by location (urban/rural), primary care orientation, LHD orientation and the use of telephone support, with or without some face to face care. Groups of programs were also compared according to a number of categorical variables, as shown below.

- **Geography** - A score reflecting the proportion of LHDs from metropolitan areas (closer to two) or rural and remote areas (closer to zero)
- **Care coordinators in LHD** - A score reflecting the proportion of LHDs that located their care coordinator in the LHD only (closer to two), or with in both the LHD and ML or ML only (closer to zero)
- **Single intake centre** - A score reflecting the intake arrangement of LHDs; closer to two indicates a higher proportion of LHDs with a single intake centre; closer to zero indicates a higher proportion of LHDs with other intake arrangements
- **Governance structure** - A score reflecting the governance arrangements of LHDs; closer to two indicates a higher proportion of LHDs with an integrated CDMP governance structure, closer to zero indicates a higher proportion of LHDs with a standalone or no CDMP governance structure
- **All other attributes** - A score reflecting the proportion of LHDs above or below the median (median = 1).
Geography

Figure 32 LHDs by geography

LHDs in metropolitan areas

Metropolitan LHDs were more likely than rural LHDs to have:
- An integrated CDMP governance structure (87.5% vs. 42.9)
- A single centre as an intake arrangement (62.5% vs. 28.6%)
- A higher primary care orientation (1.3 vs. 0.4)
- A higher primary care related information systems capacity (1.3 vs. 0.7)

LHDs in rural and remote areas

Rural and remote LHDs were more likely than metropolitan LHDs to have:
- A stronger LHD orientation (1.6 vs. 0.8)
- Located their CDMP care coordinators in the LHD only (57.1% vs. 37.5%)
- A higher use of patient telephone support than their metropolitan counterparts (1.7 vs. 0.8)
Care coordinator location

Figure 33 LHDs by care coordinator location

Care coordinators in LHD only

LHDs that located their care coordinators in the LHD only were more likely than LHDs that located their care coordinators in both the LHD and ML to have:

- A stronger LHD orientation (1.9 vs 0.6)
- A single centre as an intake arrangement (57.1% vs. 28.6%)
- An integrated CDMP governance structure (71.4% vs. 57.1)

Care coordinators in both LHD and ML

LHDs that located their care coordinators in both the LHD and ML were more likely than LHDs that located their care coordinators in only the LHD to have:

- A stronger primary care orientation (1.4 vs. 0.1)
- A higher rating regarding primary care information systems capacity (1.3 vs. 0.6)
- A higher rating regarding LHD information systems capacity (1.7 vs. 1.1)
**Intake arrangements**

Figure 34 LHDs by intake arrangements

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**Single intake centre**

LHDs with single centres for CDMP intake were more likely than LHDs with other intake arrangements to have:

1. A higher LHD orientation (1.6 vs. 0.8)
2. Located their care coordinators in the LHD only (57.1% vs. 37.5%)

**Other arrangements**

LHDs that made other arrangements for CDMP intake were more likely than LHDs that used a single centre to have:

- Located their care coordinators in both the LHD and the ML (62.5% vs. 28.6)
- A higher usage of patient phone support (1.5 vs. 0.9)
**Governance structure**

*Figure 35 LHDs by type of governance structure*

**Integrated program governance**

LHDs with integrated program governance were more likely than LHDs with standalone program governance to:

- Be located in metropolitan areas (70% vs. 0.0%)
- Have a higher primary care orientation (0.9 vs. 0.5).
- Have a single intake centre as their intake arrangement (60.0% vs. 0.0%).
- Rate higher regarding use of standard instruments for program review (1.0 vs. 0.5)

**Standalone program governance**

LHDs with standalone program governance were more likely than LHDs with integrated program governance to:

- Be located in rural and remote areas (100.0% vs. 30.0%)
- Have other options for CDMP intake rather than a single intake centre (100.0% vs. 40.0%)
- Be more LHD oriented (1.5 vs. 1.0)
- Have a higher proportion of referrals from outside of LHD hospitals (1.8 vs. 0.9)
- Have a higher use of patient telephone support (1.5 vs. 1.0).
Use of telephone support +/- face to face

Figure 36 LHDs by use of telephone support

Higher use of telephone support

LHDs with a higher use of patient phone support tended to be more likely than LHDs with a lower use of patient phone support to:

- Be located in rural and remote areas (66.7% vs. 16.7%)
- Rate higher regarding the integration of intake arrangements (1.3 vs. 0.7)
- Rate higher regarding use of standard instruments for program review (1.3 vs. 0.3).

Lower use of telephone support

LHDs with a lower use of patient phone support tended to be more likely than LHDs with a higher use of patient phone support to:

- Be located in metropolitan areas (83.3% vs. 33.3%)
- Rate lower regarding the integration of intake arrangements (0.7 vs. 1.3)
- Rate lower regarding use of standard instruments for program review (0.3 vs. 1.3)
Primary Care (PC)/LHD Orientation

Figure 37 LHDs by orientation (high LHD orientation, high primary care orientation)

Higher LHD orientation

LHDs with a higher LHD orientation tended to be more likely than LHDs with a higher PC orientation to:

- Be located in rural and remote areas (71.4% vs. 16.7%)
- Have located their CDMP care coordinators in the LHD only (85.7% vs. 0.0%)
- Have a higher proportion of referrals into the CDMP from outside of LHD hospitals (1.4 vs. 0.7)
- NB that a high LHD orientation did not necessarily correlate with higher ratings regarding LHD information systems capacity; in fact, LHDs with a high LHD orientation were rated slightly lower in this regard compared with LHDs with a high primary care orientation (1.4 vs. 1.7).

Higher PC orientation

LHDs with a higher PC orientation tended to be more likely than LHDs with a higher LHD orientation to:

- Be located in metropolitan areas (83.3% vs. 28.6%)
- Have located their CDMP care coordinators in both the LHD and ML (83.3% vs. 14.3%).
- Rate higher regarding their primary care information systems capacity than those LHDs with a high LHD orientation (1.5 vs. 0.6)
Proportion of referrals not from LHD hospitals

Figure 38 LHDs by proportion of referrals not from LHD hospitals

Higher proportion of referrals not from LHD hospitals (i.e. fewer from LHD hospitals)

LHDs with higher proportions of referrals into the CDMP not from LHD hospitals tended to be more likely than those with lower proportions of referrals to have:

- A high LHD orientation (1.5 vs. 0.8)
- A low primary care orientation (0.3 vs. 1.2)
- Standalone governance structures (50.0% vs. 0.0%)
- Other arrangements, rather than single centres, for managing CDMP intake (66.7% vs. 40.0%)

Lower proportion of referrals not from LHD hospitals (i.e. more from LHD hospitals)

LHDs with lower proportions of referrals into the CDMP from outside of LHD hospitals tended to be more likely than those with higher proportions of referrals to have:

- A high primary care orientation (1.2 vs. 0.3)
- A low LHD orientation (0.8 vs. 1.5)
- Integrated governance structures (80% vs. 50%)
- Higher ratings regarding use of phone support (1.6 vs. 1)
- Higher ratings regarding their primary care information systems capacity (1.4 vs. 1)
- Higher ratings regarding their LHD systems capacity (2.0 vs. 1.3)
- Higher ratings regarding their integration of intake arrangements (1.6 vs 0.7)
- Higher ratings regarding their use of standard instruments for program review (1.4 vs. 0.7).

Where referrals did not come from LHD hospitals, they tended to come from other LHD services rather than from primary care.
Groupings of composite variables describing LHD programs

We then grouped these variables according to whether they were contextual, or reflected aspects of the design or the operation of the LHD program.

Table 6 Groups of composite variables describing LHD programs

<table>
<thead>
<tr>
<th>Context</th>
<th>Design of program</th>
<th>Operation of program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Location of care coordinators</td>
<td>% of referrals not from LHD hospitals</td>
</tr>
<tr>
<td>• Metropolitan</td>
<td>• LHD only</td>
<td>% of people receiving telephone support</td>
</tr>
<tr>
<td>• Rural</td>
<td>• ML only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• LHD and ML</td>
<td></td>
</tr>
<tr>
<td>Governance structure</td>
<td></td>
<td>LHD orientation</td>
</tr>
<tr>
<td>• Integrated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stand alone</td>
<td></td>
<td>PC orientation</td>
</tr>
<tr>
<td>Intake system</td>
<td></td>
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<tr>
<td>• Single intake system</td>
<td></td>
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<tr>
<td>• Other arrangements</td>
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<tr>
<td>Information system capacity</td>
<td></td>
<td></td>
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<tr>
<td>• Within LHD</td>
<td></td>
<td></td>
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<tr>
<td>• Between LHD and PC</td>
<td></td>
<td></td>
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<tr>
<td>Use of standard instruments for assessments</td>
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</tbody>
</table>

Using these groupings, the following patterns emerged.

Context influenced program design. Metropolitan programs were more likely to have integrated governance and a single intake centre, more adequate information system links with primary care and a greater primary health care orientation, where rural and remote programs tended to locate their care coordinators in the LHD only, had a stronger LHD orientation and made greater use of telephone support. This may reflect more systematic approaches and capable systems within metropolitan areas where services are more dense; and less capacity to move outside the LHD in rural areas, where services are more devolved and have less complex infrastructure, and primary care services may be more stretched.

In terms of design, there were two broad groupings. Where care coordinators were based in the LHD only, this tended to be part of a more integrated approach, with integrated governance, a single intake system, higher use of tools for program review and stronger LHD orientation. Where care coordinators were in both locations, information systems tended to be stronger, perhaps to cope with a more decentralised program, and a higher primary care orientation. This shows the importance of this foundational element of program design.

There were also associations between design and program operation. Referrals to the Program from LHD hospitals tended to be higher where there was integrated governance, high information system capacity, high integration of intake arrangements with other programs, and high use of tools for program review. This suggests that where the Program was more systematic and integrated with other parts of the LHD, this allowed the hospital to dominate enrolments. By contrast, a higher proportion of enrolments came from elsewhere in the LHD (but not from primary care) where there was stand-alone governance and other intake arrangements, and care coordinators were in the LHD only – perhaps giving them more opportunities to engage with other LHD services and facilitate their referrals.
3.2 Characteristics of CDMP models and implementation for Aboriginal people

Aboriginal health

Aboriginal people access all parts of the health system, and there are also a broad range of programs and services in all districts that are designed to deliver culturally appropriate health care specifically to Aboriginal people. Particularly relevant to chronic disease are the primary health care services delivered by ACCHSs, and the State and Commonwealth funded programs that have been designed with a specific chronic disease focus, such as 48 Hour Follow-Up, the Care Coordination and Supplementary Services (CCSS) Program, and Aboriginal chronic disease programs based in Community Health parts of the LHDs.

ACCHSs deliver a model of comprehensive primary health care for Aboriginal people which has a major focus on chronic disease prevention and management, and includes clinical care, health promotion and prevention programs, transport, provision or facilitated access to specialist and allied care services, care coordination, and other a broad range of other services.

The 48 Hour Follow-Up Program, a core component of the NSW Health Chronic Care for Aboriginal People Program, is one such program which is delivered by LHDs. The 48 Hour Follow-Up Program aims to provide follow-up to Aboriginal people aged over 15 years with chronic diseases within 48 hours of discharge from an acute care facility.

The Federal Government’s CCSS Program is another program being rolled in NSW through MLs. The CCSS Program is designed to improve health outcomes for Aboriginal and Torres Strait Islander people with chronic health conditions by improving access to coordinated and multidisciplinary care through funding of allied health and specialist visits and transport services and the provision of care coordination. The CCSS Program has consistently featured in the interviews and Aboriginal clients are often enrolled in both the CCSS Program and CDMP and receive services concurrently.

The intersection of the CDMP with 48 Hour Follow Up and the CCSS Program was a key point of interest in the case study site visits.

Case study sites

The three case study sites were based in regions with diverse yet well-developed programs and relatively large Aboriginal populations. The case study sites were:

- Western Sydney LHD
- Western NSW LHD
- Hunter New England LHD

Interviews

Interviews with health service providers and managers extended beyond those working in the LHD and MLs to those working in the ACCHS sector.

Interviews of Aboriginal patients enrolled to the CDMP in the three intensive case study sites and who had agreed to be contacted by the Evaluation Team to be interviewed about the Program and care and management of their chronic condition were conducted at the time of the case study site visit and are reported in this section of the report.
3.2.1 Overview – Key similarities and differences in approaches

This section brings together the key findings of the three case studies to explore the similarities and differences of the CDMP’s delivery to Aboriginal people in three LHDs in NSW.

Western Sydney LHD covers a geographically small, yet population dense area providing health care to urban residents of the Western Sydney district. On the other hand, Western NSW LHD and Hunter New England LHD each cover far larger geographic areas and provide health services to regional, rural and remote areas of NSW.

Western Sydney, Western NSW and Hunter New England LHD’s each have well developed programs and have met their enhanced targets for enrolment of Aboriginal people into the Program. The programs differ in terms of their model of care and referral pathways, how they integrate with other services providing Aboriginal specific chronic disease care and the Program’s reach to Aboriginal people in each region.

Referral of Aboriginal people into the CDMP and how care is delivered

Identification and referral into the CDMP for Aboriginal people

- In each LHD the main referral pathway was through the acute care sector - made either by the LHD CDMP Care Coordinator or the 48 Hour Follow-Up worker.
- The 48 Hour Follow-Up Program was a key referral pathway in Western Sydney LHD and the Hunter New England LHD. In both these sites the 48 Hour Follow-up staff member sits within the CDMP - in terms of its physical location and its organisational/management structure.
- On the other hand, Western NSW LHD received referrals from LHD CDMP Care Coordinators based in the acute hospital setting. The 48 Hour Follow-Up Program did not regularly refer into the CDMP and was not positioned with CDMP staff or its management structure. Western NSW LHD also received referrals from GP, LHD community health and the ACCHS sector.
- Referrals from the ACCHSs were not common in Western Sydney LHD and Hunter New England LHD.
- Accurate identification of Aboriginality was part of the enrolment process and was routinely asked in each of the programs.

Aboriginal clients and stratification

- Aboriginal clients were not stratified based on Aboriginality but according to assessed level of risk.
- Western Sydney LHD and Hunter New England LHD stratify based on risk. Aboriginal clients were referred to services in the community, provided by other LHD departments, the ML and an external health coaching provider.
- There was a single model of care coordination in Western NS W and no stratification. All CDMP Aboriginal clients were cared for by their GP (in private GP or the ACCHS).

Delivery of care for Aboriginal clients

- Each of the three sites had a slightly different approach to delivering care within the CDMP structure, yet a striking similarity is their strong working relationships with their MLs and its role in care coordination.
- Western NSW LHD’s delivery model was GP-centred and based around shared care plans (using the Chronic Disease Management (CDM) Medicare Items) and the development of communication tools to enable the care plans to be shared amongst care providers. Western Sydney LHD and Hunter New England LHD focused on care coordination provided by nursing and the allied health sector delivered as a telephone-based service (Level 1) or by the ML and LHD Community Health (Level 2 and Level 3) respectively as an intensive case management approach.
Integration with other services providing Aboriginal specific chronic disease care

- Each program had developed strong working relationships with their MLs. Western Sydney LHD and Hunter New England LHD funded their relevant MLs to provide clinical care coordination (which include home visits). Due to capacity constraints, there was no clinical care coordination provided by Western NSW ML, instead they provided support to GP who provided the clinical care coordination.
- Aboriginal clients, regardless of their level of stratification, were commonly linked in with the ML to access the CCSS Program. As a result, many Aboriginal clients were enrolled in both programs: the care coordination provided under CDMP and the financial support and other support services provided under the CCSS Program (Supplementary Services component).
- There was minimal inclusion of the ACCHS sector in the referral, enrolment and care of Aboriginal patients within the CDMP.
- There was Aboriginal representation on each of the CDMP governance structures, either from the LHD, the ML or the ACCHS sector.

The Program’s reach to Aboriginal people across the LHD

- A number of interviewees commented that contacting Aboriginal people via telephone – in particular ‘cold calling’ – may not be a particularly successful way of engaging this group in the Program.
- Aboriginal health service providers were involved in the identification, referral and care of Aboriginal people enrolled in the CDMP. They were not employed directly by the CDMP but contributed to the Program from the LHD Aboriginal Health Workers (AHWs) and 48 Hour Follow-Up workers, the MLs (Closing the Gap – CTG - Team) and the ACCHS sector. Their contribution was multi-faceted and integral to the delivery of the Program – in identification and referral of eligible clients, care and management of enrolled clients, or guidance on provision of culturally appropriate care to non-Aboriginal staff working with Aboriginal clients.
- All LHDs had initially focused on developing their model of care and had enrolled Aboriginal clients identified through the acute care sector. As the service developed and the Program’s capacity strengthened, each LHD focused on the developing their CDMP model of care to a broader reach within their LHD.

3.2.2 Case Study 1 – Hunter New England LHD

The Hunter New England region, health services and Aboriginal chronic disease programs

The Hunter New England LHD is one of the largest Health Districts in NSW and covers a significant geographic area of almost seven hundred kilometres from north to south, and around five hundred kilometres from east to west. The District is a mix of remote, rural and urban communities and there is a large Aboriginal population which makes up 4% of the total HNE population and over 20% of the NSW Aboriginal population.

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84 Heath Statistics New South Wales. Version 1.10.2m. NSW Government.  
The CDMP and Aboriginal participants

At the end of 2013 there are 2358 Aboriginal participants enrolled in the CDMP across NSW. 545 participants identified as Aboriginal from the Hunter New England LHD. The following tables show a summary of demographics for the Aboriginal participants enrolled in the Hunter New England LHD.

### Table 7 Age (at enrolment of Aboriginal CDMP participants in Hunter New England)

<table>
<thead>
<tr>
<th>Age (at enrolment)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
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<td>0.0</td>
</tr>
<tr>
<td>&lt;50 years</td>
<td>148</td>
<td>27.2</td>
</tr>
<tr>
<td>50-65 years</td>
<td>214</td>
<td>39.3</td>
</tr>
<tr>
<td>65-&lt;75 years</td>
<td>129</td>
<td>23.7</td>
</tr>
<tr>
<td>≥ 75 years</td>
<td>54</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Across Hunter New England, almost sixty-seven per cent of the Aboriginal CDMP participants are aged between 16-65 years. Only 9.9% are 75 years and older.

### Table 8 Gender of Aboriginal CDMP participants in Hunter New England

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
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<td>0.0</td>
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<tr>
<td>Female</td>
<td>251</td>
<td>46.1</td>
</tr>
<tr>
<td>Male</td>
<td>294</td>
<td>53.9</td>
</tr>
</tbody>
</table>

Across Hunter New England LHD, there were more Aboriginal males (53.9%) than females (46.1%) enrolled in the CDMP.

### Interviews of health service providers and managers in Hunter New England

The CDMP operated out of two Hubs in Hunter New England Health – Tamworth and Newcastle and interviews were conducted with a range of stakeholders from the LHD, MLs and ACCHSs actively involved in the care and management of Aboriginal people with chronic disease. The Evaluation Team conducted face-to-face interviews in Armidale, Tamworth and Newcastle and phone interviews spanning the region.

Eighteen semi-structured in-depth interviews were conducted with twenty-six stakeholders. As described in Table 9, eight of the twenty-six stakeholders identified as Aboriginal. There was only one interview conducted with the ACCHS sector and it was conducted with the CEO of a remote ACCHS.

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85 The demographic detail for Aboriginal people on the CDMP for the intensive case-studies comes from the CDMP MDS.
Table 9 Number of health service providers and managers interviewed across Hunter New England separated by health service and Aboriginality

<table>
<thead>
<tr>
<th>Name of Health Service</th>
<th>Number of Health Professionals Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New England</td>
</tr>
<tr>
<td></td>
<td>Aboriginal</td>
</tr>
<tr>
<td>Hunter New England LHD</td>
<td>2</td>
</tr>
<tr>
<td>New England ML &amp; Hunter ML</td>
<td>2</td>
</tr>
<tr>
<td>ACCHS</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5</td>
</tr>
</tbody>
</table>

Ten interviews were conducted face-to-face and the remaining interviews were via telephone. They were all one-to-one or small group (up to three participants) interviews. Two members of the Evaluation Team were present at all interviews (one as the interviewer and the other as the scribe) and informed consent and basic demographic information was obtained from all interview participants.

The CDMP model of care

Referral and enrolment of Aboriginal clients in the CDMP

As shown in Figure 39, the two hubs had slightly different referral pathways and care stratification. Key points about the overall model of care for Aboriginal clients (incorporating program variances) follow Figure 39.

Figure 39 The CDMP model of care for the Hunter New England LHD

New England region referral pathways
• Aboriginal people in the New England region were predominantly referred into the CDMP through Tamworth Base Hospital. The CDMP is located on the grounds of Tamworth Base Hospital and the LHD CDMP Care Coordinators attended hospital chronic disease meetings, identified potential CDMP clients and visited them while they were in hospital.
• The 48 Hour Follow-up Program regularly referred to the Program but did not make up great numbers of Aboriginal clients enrolled in the CDMP.
• The LHD Aboriginal chronic disease program called the Integrated Care for Aboriginal People Program was not a referral pathway for the CDMP.

*Hunter region referral pathways*

  o Aboriginal people in the Hunter region were predominantly referred into the CDMP through the 48 Hour Follow-up Program.
  o Aboriginal people might also be referred through LHD Outpatient Services based in the community, such as, cardiac or cardiopulmonary rehabilitation, or diabetes services.
  o They were referred to the Referral and Information Centre (RIC), which is a single contact centre for centralised intake based in Newcastle, and referral into LHD community services.

• Both hubs asked within their enrolment process whether a patient identified as Aboriginal. This information was recorded in the client’s electronic health records.
• Recently, both hubs extended their referral to accept referrals from GPs (and thus referrals from ACCHSs). At the time of the site visit, these referrals were not common.

*Care of Aboriginal clients in the CDMP*

• LHD CDMP Care Coordinators completed a comprehensive assessment using a standardised intake form to determine what services would best suit a client. There was no different assessment for Aboriginal people.
• Clients were stratified according to their level of risk. See Table 10 below for details of care provided for each level.
• Aboriginality was not a basis for stratification.
Table 10 Stratification of CDMP clients in the Hunter New England LHD (separated into Hunter region and New England region)

<table>
<thead>
<tr>
<th>Level</th>
<th>Service &amp; Service Provider</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1     | Telephone Health Coaching | Provider: Healthways Australia
       |   (*currently not offered in New England region – under review) | Telephone-based health coaching service
       |   | Provided by Healthways or referred to the Get Healthy Information and Coaching Service |
| 2     | Telephone Care Coordination | Provider: Referral and Information Centre – Hunter region, CDMP Contact Centre - New England region | Telephone based service provided by the LHD CDMP Care Coordinators.
       |   | If required, will liaise with the 48 Hour Follow Up worker to be guided on Aboriginal services and referral into them. |
| 3     | Care Coordination | Provider: Hunter ML & New England ML | The Care Coordinator will visit the client at home with an Aboriginal health worker (AHW) and a comprehensive personal assessment will take place, building on the client’s initial CDMP assessment. |

- At the time of the site visit there was no health coaching provided by Healthways/Get Healthy Service for the New England region. The New England CDMP was in the process of developing its own in-house health coaching service.
- The Newcastle RIC and the New England CDMP regularly referred Aboriginal CDMP clients for ML Care Coordination as this provided a direct pathway to the CCSS Program. Aboriginal CDMP clients were enrolled in both programs concurrently.

**CDMP and integration with other programs/services in Hunter New England**

The CDMP focused on building linkages with service providers in the local area to enhance referrals and to provide care to enrolled CDMP clients. Specifically, links had been developed with two programs that are designed to provide culturally appropriate care for Aboriginal clients with chronic diseases: the 48 Hour Follow-up Program and the CCSS Program at Hunter and New England MLs.

**CDMP & the 48 Hour Follow-up Program**

- The 48 Hour Follow-Up Program routinely referred eligible Aboriginal clients to the CDMP.
- The 48 Hour Follow-up Program was co-located with the CDMP which facilitated integration of the services.
- Both programs shared patient information via CHIME (Community Health IT system).

**CDMP & the ML (New England and Hunter MLs)**

- Clinical care clients were managed by ML-based Care Coordinators funded by the CDMP.
- The CCSS Program, particularly the supplementary services component, was accessed as a service for all CDMP Aboriginal clients in HNE LHD.
The organisations had an effective partnership service agreement and clinicians and managers from the CDMP and MLs communicated on a formal and informal basis as follows:

- Formally - Representing their organisations at the CDMP Partnership Committee which oversees governance of the Program and regular partner meetings to discuss clinical and managerial issues relating to the CDMP,
- Informally – discussing care and management of clients via telephone, email and fax.

**CDMP and the Aboriginal Community Controlled Health Service Sector**

- In general, the ACCHS sector in Hunter New England did not make referrals to the CDMP.
- The ACCHS sector was not actively involved in the delivery of the CDMP but had clients that are enrolled in the Program.

**Reach and Access**

This section discusses the reach of the CDMP in the region, and details the patient’s experience of the CDMP.

- Using ARIA (Accessibility/Remoteness Index Australia) to classify remoteness, in early 2014 the CDMP MDS reported 40.9% of Aboriginal participants living in the Hunter New England LHD were from ‘major cities of Australia’, 34.6% from ‘inner regional’, 23.8% from ‘outer regional’ and 0.7% from ‘remote Australia’.
- The Program’s reach was impacted positively by the referral of 48 Hour Follow-Up patients who are discharged from the hospitals across the District, spanning urban and regional areas.
- The MLs provided care to those located in town centres and in regional and remote areas of the LHD. This provided access to care to a broader reach of Aboriginal patients.
- It was acknowledged that the use of telephone to consent and assess Aboriginal clients can deter them from participating in the Program. It was stated by one care coordinator: “So getting people on the phone, once you’ve got people engaged and they understand what the Program is I think it is fine but it’s the getting people on the phone that’s the trick”.

**Patient experience of the CDMP**

Five Aboriginal patients living in different areas of the Hunter New England region (urban, regional and remote) were interviewed and invited to tell their story of engagement with the Program.

- Patients sought care from private GPs and the ACCHS. In remote areas, there was not a defined care provider but an integrated approach to care which involved the GP, ACCHS, and LHD Community Health.
- Overall, patients had received phone calls regarding the care and management of their chronic diseases.
- The majority of interviewees were aware of the Program and spoke of care provided by CDMP Care Coordinators from the LHD and ML.

**Added value (from a health service provider and manager perspective)**

**CDMP offers program structure to provide better care**

It was reported that the CDMP provided the ability to monitor clients as they access a variety of services for their care. As one care coordinator commented:
“... I think we can monitor that to some extent. We do try and keep in touch with people to see how they’re going “.

CDMP requires time before its benefit will be clearly understood

A couple of interview participants in the Hunter region reported that the Program added value to chronic disease care but commented:

“I think it identifies the people and puts them in touch, well puts them in the loop, but I think it will be a long time before, like we need to get the trust and the, those sort of things will take time and I think it will take time to see outcomes because mainly of trust”.

3.2.3 Case Study 2 – Western NSW LHD

The Western NSW region, health services and Aboriginal chronic disease programs

The Western NSW LHD is responsible for providing primary, secondary and tertiary care to residents of Western NSW. Western NSW is the second most sparsely populated LHD in NSW with just over 1 person per square km (271,000 people: 250,000 square km). Overall 9.4% of the LHDs population identify as Aboriginal and the proportion of the population that is Aboriginal rises from 4% in Bathurst to 11% in Dubbo and to 27% in ‘Remote’. This compares to an Aboriginal population of 2.3% in NSW86. There is minimal population growth across the region (just 2% over the past five years)87. Within the LHD there are more than ten ACCHSs88 and two MLs, Western NSW and Far West, focusing on local needs and servicing the region.

The CDMP and Aboriginal participants in the Western NSW LHD

At the end of 2013 there are 2358 Aboriginal participants enrolled in the CDMP across NSW. 467 participants were reported as Aboriginal from the Western NSW LHD. The following tables show a summary of demographics for the Aboriginal participants enrolled in the Western NSW LHD.

Table 11 Age (at enrolment) of Aboriginal CDMP participants in Western NSW

<table>
<thead>
<tr>
<th>Age (at enrolment)</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>162</td>
<td>34.7</td>
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<tr>
<td>&lt;50 years</td>
<td>103</td>
<td>22.0</td>
</tr>
<tr>
<td>50 - 65 years</td>
<td>103</td>
<td>22.0</td>
</tr>
<tr>
<td>65-&lt;75 years</td>
<td>73</td>
<td>15.6</td>
</tr>
<tr>
<td>≥ 75 years</td>
<td>26</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Across Western NSW, almost sixty eight per cent of the Aboriginal CDMP participants are aged between 16-65 years. Only 5.6% are 75 years and older.

---


Table 12 Gender of Aboriginal CDMP participants in Western NSW

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Female</td>
<td>166</td>
<td>44.1</td>
</tr>
<tr>
<td>Male</td>
<td>229</td>
<td>55.9</td>
</tr>
</tbody>
</table>

Across Western NSW, there are more Aboriginal males (55.9%) than females (44.1%) enrolled in the CDMP.

Interviews of health service providers and managers in Western NSW LHD

The CDMP operated out of Dubbo. Interviews were conducted with a range of stakeholders from the LHD, MLs and ACCHSs actively involved in the care and management of Aboriginal people with chronic disease. The Evaluation Team conducted interviews in Dubbo and Orange and phone interviews to Brewarrina and Coonamble.

Six semi-structured in-depth interviews were conducted with twenty-one stakeholders. Seven of the twenty-one health service providers and managers interviewed identified as Aboriginal. There was no Aboriginal representation from the Western NSW ML.

Table 13 Number of health service providers and managers interviewed across Western Sydney, separated by health service and Aboriginality

<table>
<thead>
<tr>
<th>Name of Health Service</th>
<th>Number of Health Professionals Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aboriginal</td>
</tr>
<tr>
<td>Western NSW LHD</td>
<td>6</td>
</tr>
<tr>
<td>Western NSW ML</td>
<td>0</td>
</tr>
<tr>
<td>Regional ACCHS</td>
<td>1</td>
</tr>
<tr>
<td>Remote ACCHS</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7</td>
</tr>
</tbody>
</table>

Five interviews were face-to-face and one was via telephone. The face-to-face interviews were mostly small group interviews (up to three interviewees); however there was one focus group of 10 participants with representatives from the LHD, the local ACCHS and Western NSW ML. Two members of the Evaluation Team were present at all interviews (one as the interviewer and the other as the scribe) and informed consent was obtained from all interview participants.

The CDMP model of care

Referral and enrolment of Aboriginal clients into the CDMP

Figure 40 shows the CDMP model in Western NSW at the time of the site visit in late 2013. It operated as a single model of care coordination, with health coaching incorporated into the roles of the care coordinators and existing primary care clinicians in the community and GP setting.
Key points are as follows:

- Aboriginal people were predominantly referred through GP (which includes ACCHSs) and the acute sector, specifically Dubbo, Orange and Bathurst Base Hospitals.
- The 48 Hour Follow-up Program was not a referral pathway for the CDMP.
- In some remote towns, the LHD Aboriginal Community Health team identified and refers Aboriginal patients into the CDMP.
- Aboriginal and/or Torres Strait Islander identification was asked as part of the enrolment process. This information was recorded within the client’s electronic health records.
- LHD-based CDMP care coordinators were employed in the three base hospitals and enrol Aboriginal patients identified through hospital presentations.
- ML-based CDMP care coordinators worked with GP and ACCHSs to identify eligible patients, enrol them and support the generation of a shared care plan. At the time of the case study site visit, ML-based CDMP care coordinators were operational in Western NSW ML but not in Far West ML.

**Care of Aboriginal clients in the CDMP**

**A single model of care**

- The Program operated as a single model of care coordination, and health coaching was incorporated into the roles of the care coordinators and primary care clinicians. A range of nurses and Aboriginal health workers had undertaken health coaching training; this training was funded through the CDMP and offered to LHD, ML, ACCHS and GP staff involved in the CDMP. Training was provided through a private consulting and training organisation called Health Change Australia.
Improvements to IT infrastructure and enhanced communication

- Improvements to IT infrastructure and enhanced communication between the health sectors were integral to the concept and design of the CDMP in Western NSW.
- The CDMP funded the rolled out of ARGUS, a messaging broker. The rollout of ARGUS aimed to facilitate electronic communication between the LHD, and with MLs, GPs and ACCHSs. ARGUS was made available to relevant staff in the LHD and ML and was being rolled out to relevant staff in the GP sector (including ACCHSs) operating in Western NSW ML. Where ARGUS was not available or could not be used, fax and telephone contact was used.
- There were technical difficulties with ARGUS and its implementation into sites involved in the CDMP. Medical software in some GPs and ACCHSs was not compatible with ARGUS and therefore ARGUS was not used. Where ARGUS could not be implemented, fax and telephone were relied upon.
- Documentation for the Program, such as GP care plans, was sent through ARGUS and these documents are uploaded to the client’s hospital record allowing access to care plans by acute hospital staff when the client presented to hospital.

Development of care plans

- The model in Western NSW LHD focused on the development of care plans which were shared among providers, preferably through secure messaging (ARGUS) or by fax. GP and the ACCHS sector were responsible for assessment and development of care plans and these were developed in the community with the client.
- These care plans were usually based around the Chronic Disease Management Medicare Items - GP Management Plan (GPMP) and Team Care Arrangements (TCAs). Clinicians were able to provide a health summary if they preferred.
- Support was provided to GPs/ACCHSs through the employment of ML-based CDMP Care Coordinators whose role was to act as a facilitator working alongside the GPs to enrol the client, ensure an assessment was conducted and a care plan developed. The ML-based Care Coordinators did not provide clinical care coordination.

Process when a client was admitted to hospital

- When an Aboriginal CDMP client was admitted to hospital, the LHD Care Coordinators acted as the interface between the acute sector and community sector, notifying GPs of the enrolled patient’s admission and providing intensive care coordination in partnership with the GP and other nominated care providers (i.e. CCSS Program Care Coordinator, AHWs, Chronic Care Nurses). A discharge summary and CDMP summary page were sent to the primary care practitioner(s) providing care in the community.

Process when a client is discharged from hospital

- LHD CDMP Care Coordinators contacted Aboriginal and non-Aboriginal CDMP clients within 72 hours of discharge to ensure appropriate links had been made to GPs, ACCHSs, Specialists and other services post discharge.
General Practitioners regularly referred Aboriginal clients to the CCSS Program so Aboriginal CDMP client were frequently enrolled in both programs and the Care Coordinators and GP worked together caring for the client.

Integration of the CDMP with other programs/services in Western NSW

The CDMP was managed through the LHD and had focused on building linkages with service providers in the local area, particularly with GPs and ACCHSs in Western NSW ML and regional/rural LHD Community Health Services. It was the responsibility of the Western NSW ML to build links with GP (including the ACCHS sector), and the funding of ML-based care coordinators to liaise with GPs and ACCHSs facilitated this process (detailed below).

The CDMP & the ML

- There are two MLs that sit in the Western NSW LHD – Western NSW ML and Far West ML. The CDMP had been working closely with the Western NSW ML and at the time of the site visit was establishing a relationship with Far West ML.
- Western NSW ML had been funded by the CDMP to raise awareness of the Program and to enable GP and the ACCHS sector to identify, enrol and care for CDMP clients.
- The ML-based Care Coordinators did not provide clinical care coordination but acted as a facilitator working alongside the GPs to enrol the client, ensure an assessment was conducted, and a care plan developed.
- The CCSS Program was accessed as a service for CDMP clients, particularly the Supplementary Services component. As one LHD employee stated:
  
  “I think where we intersect very effectively is with the ML CCS Program ... they will refer to us, and we refer to them, and they’re integral to providing that intensive care coordination for those Aboriginal patients that are registered on the Program in the community”

- The two organisations had an effective partnership service agreement and clinicians and managers from the CDMP and Western NSW ML communicated on a formal and informal basis as follows:
  - Formally - representing their organisations at the CDMP Management Committee meetings,
  - Informally – discussing care and management of clients via telephone, email and fax.

The CDMP & rural/remote LHD Community Health

- The CDMP had worked closely with rural/remote Community Health Services (LHD) to encourage recruitment to the Program. This is in areas with large Aboriginal resident population.
- AHWS had taken up promoting the Program and were actively involved in registering and enrolling Aboriginal clients.
- The LHD Care Coordinators based in the Base Hospitals were available to provide support to AHWS and nurses through ARGUS or fax/telephone when a client was admitted to hospital.

Reach and access

This section discusses the reach of the CDMP in the region, and details the patient’s experience of the CDMP.

- The use of secure messaging (ARGUS) was seen to provide service providers with improved capacity to share patient information, particularly those health professionals who were traditionally excluded from this shared communication due to remoteness.
• The Program’s reach was impacted positively by the MLs working relationships with GPs located in large town centres and in regional and remote areas of the region. They were inclusive of ACCHSs in this approach and this provided a broader reach of potential Aboriginal patients.
• The CDMP MDS indicates that Aboriginal participants in the Western NSW LHD were predominantly from the town centres (48.2%). Over a quarter (29.4%) lived outside the town centres in outer regional areas and just under a quarter (22.3%) lived in locations considered remote.
• There were no Aboriginal people employed directly by the CDMP at the LHD or at the ML.
• The involvement of AHWs in remote parts of the region (far North West of NSW) improved the reach of the Program. As one CDMP manager stated:

“...it’s actually been really positive. Because AHWs are becoming involved - we’ve got some really good AHWs that are champions now for Connecting Care...”

Patient experience of the CDMP

Six Aboriginal patients living in different areas of Western NSW (town, regional and remote) were interviewed and invited to tell their story of engagement (or non-engagement) with the Program.

• Aboriginal patients sought care from ACCHSs and private GPs.
• The majority of interviewees were aware of the Program and spoke of the involvement of the LHD and ML Care Coordinators in their care.
• Overall, Western NSW interviewees were satisfied or very satisfied with care and generally did not have barriers to receiving care; one individual was not satisfied with care provided by CDMP but was very satisfied with the care provided by their GP.

Added value (from the health service provider and manager perspective)

CDMP provides opportunity for enhanced communication between organisations

It was acknowledged that the Program provided an opportunity for formal and informal communication between providers of care within the acute and primary care sector. One care coordinator commented:

“We needed the top of all the organisations to say you are allowed to communicate. Because before we all had this confidentiality bubble around us which was so bad for patient care, very useful in a lot of ways, but how many times you don’t get the information that you need. And this has actually opened the communications so we can actually get the information that you need”.

CDMP provides structure to address social issues that impact patient’s health

The CDMP was viewed as a means to address the broader social issues that impact on a patient’s ability to care for their chronic disease(s). As one manager stated:

“But I think that for Aboriginal patients and non-Aboriginal patients where Connecting Care does add value is it does address a lot of those social issues that are going to impact on their health”.

3.2.4 Case Study 3 – Western Sydney LHD
The Western Sydney region, health services and Aboriginal chronic disease programs

The Western Sydney LHD is responsible for providing primary and secondary health care for people living in Auburn, Blacktown, the Hills Shire, Holroyd and Parramatta Local Government Areas (LGAs) and tertiary care to residents of the Greater Western Region. In 2013, the estimated resident population of WS LHD was 876,500. In 2011, the Aboriginal population accounted for approximately 1.5% of the District’s population with the larger Aboriginal communities living in Blacktown. The ML, called WentWest, is involved in the delivery of care to Aboriginal people with chronic disease and aims to provide programs and services that are culturally appropriate for the local Aboriginal population. Primary care services to Aboriginal people in Western Sydney are delivered by LHD Community Health services, GP (including services provided through WentWest ML) and the Aboriginal Medical Service Western Sydney – the local ACCHS.

The CDMP and Aboriginal participants in Western Sydney

At the end of 2013 there were 2358 Aboriginal participants enrolled in the CDMP across NSW. 365 participants were reported as Aboriginal living in the Western Sydney LHD. The following tables show a summary of demographics for the Aboriginal participants enrolled in the Western Sydney LHD.

Table 14 Age (at enrolment) of Aboriginal CDMP participants in Western Sydney

<table>
<thead>
<tr>
<th>Age (at enrolment)</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>&lt;50 years</td>
<td>178</td>
<td>48.8</td>
</tr>
<tr>
<td>50-65 years</td>
<td>116</td>
<td>31.8</td>
</tr>
<tr>
<td>65-&lt;75 years</td>
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<td>12.9</td>
</tr>
<tr>
<td>≥ 75 years</td>
<td>24</td>
<td>6.5</td>
</tr>
</tbody>
</table>

A little over eighty per cent of Aboriginal CDMP participants in Western Sydney LHD are aged between 16 – 65 years. Only 6.5% are 75 years and older.

Table 15 Gender of Aboriginal CDMP participants in Western Sydney

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Female</td>
<td>135</td>
<td>37.0</td>
</tr>
<tr>
<td>Male</td>
<td>230</td>
<td>63.0</td>
</tr>
</tbody>
</table>

In Western Sydney, there were more Aboriginal males (63%) than females (37%) enrolled in the CDMP.

Interviews of health service providers and managers in Western Sydney LHD

Interviews were conducted with a range of stakeholders from the LHD, ML and ACCHSs actively involved in the care and management of Aboriginal people with chronic disease. The Evaluation Team conducted face-to-face interviews in Mt Druitt and Blacktown.

Seven semi-structured in-depth interviews were conducted with eleven stakeholders. As described in Table 16, six of the eleven health service providers and managers interviewed identified as Aboriginal.

Table 16 Number of health service providers and managers interviewed across Western Sydney LHD, separated by health service and Aboriginality

<table>
<thead>
<tr>
<th>Name of Health Service</th>
<th>Number of Health Professionals Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aboriginal</td>
</tr>
<tr>
<td>Western Sydney LHD</td>
<td>1</td>
</tr>
<tr>
<td>WentWest ML</td>
<td>3</td>
</tr>
<tr>
<td>Aboriginal Medical Service Western Sydney</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6</td>
</tr>
</tbody>
</table>

All interviews were completed face-to-face in small groups (up to three participants). Two members of the Evaluation Team were present at all interviews (one as the interviewer and the other as the scribe) and informed consent was obtained from all interview participants.

The CDMP model of care

Referral and enrolment of Aboriginal clients into the CDMP

Figure 41 shows the CDMP model and illustrates the main referral pathway for Aboriginal clients into the CDMP, their enrolment through the CDMP Health Contact Centre and subsequent stratification based on need.

Figure 41 Western Sydney Local Health District’s CDMP model

Key points are as follows:
As illustrated in Figure 41, Aboriginal clients were predominantly referred into the CDMP from Blacktown and Mt Druitt hospitals and through the 48 Hour Follow-Up Program after a hospital admission.

They were referred to the centralised CDMP Health Contact Centre (HCC), which is on the grounds of Blacktown Hospital and is staffed by registered nurses and some allied health staff. There was a full-time Nurse Unit Manager employed by the CDMP responsible for the day-to-day management of the Centre.

This centre enrolled both Aboriginal and non-Aboriginal clients into the CDMP.

Aboriginal and/or Torres Strait Islander identification was asked as part of the enrolment process. This information was recorded within the client’s electronic health records.

Aboriginal clients were also referred (though less frequently) through community programs and services such as cardiac rehabilitation, the Community Aboriginal Chronic Care Nurse, and the Aboriginal renal screening bus.

GP and ACCHS referrals to the CDMP were uncommon, yet these sectors did refer to the WentWest CTG team.

Care of Aboriginal clients in the CDMP

- Following a phone assessment using the ‘Service Needs Assessment Tool’ or SNAT conducted by a registered nurse at the HCC, clients were stratified into three levels. There was no different assessment for Aboriginal people.
- The clients’ score dictated which level of care the client would receive (level 1, level 2 or level 3). See Table 17 below for details on care provided and review process for each level.
- Aboriginality was not a basis for stratification.
Table 17 Stratification and review of Aboriginal clients

<table>
<thead>
<tr>
<th>Level</th>
<th>Service &amp; Service Provider</th>
<th>Description</th>
<th>Review process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Telephone Health Coaching Provider: CDMP Health Contact Centre</td>
<td>Telephone based service provided by the HCC staff. If required, will liaise with the 48 Hour Follow Up worker to be guided on Aboriginal services and referral into them.</td>
<td>Called every 6 months (if no hospitalisations). The review period is shortened if there is a hospitalisation or if the client calls the contact centre.</td>
</tr>
<tr>
<td>2</td>
<td>Care Coordination Provider: WentWest – ML</td>
<td>HCC refers client to WentWest CTG Team. The CTG manager determines whether the Aboriginal client will benefit from care within the CDMP or CTG. If the client is referred to the CDMP Care Coordinator, the Care Coordinator will visit the client at home with an AHW and a comprehensive personal assessment will take place, building on the client’s initial CDMP assessment.</td>
<td>3 month and a 6 month review – level of service is normally around 6 months and then they would return to the HCC.</td>
</tr>
<tr>
<td>3</td>
<td>Intensive Case Management Provider: Community Health (LHD)</td>
<td><em>Not common – most Aboriginal clients were referred to Level 1 and Level 2.</em> Client will receive intensive case management from a multi-disciplinary team of health professionals.</td>
<td>6 monthly reviews. No time limit on case management duration.</td>
</tr>
</tbody>
</table>

CDMP and integration with other programs/services in Western Sydney

The CDMP had focused on building linkages with service providers in the local area to enhance referrals and to provide care to enrolled CDMP clients. Specifically, links had been developed with two programs designed to provide culturally appropriate care for Aboriginal clients with chronic diseases: the 48 Hour Follow-up Program and the CCSS Program provided by the CTG Team at WentWest.

CDMP & the 48 Hour Follow-up Program

- All Aboriginal clients discharged through Blacktown and Mt Druitt hospital were routinely invited to enrol in the 48 Hour Follow Up Program and therefore were invited to enrol in the CDMP.
- All 48 Hour Follow Up clients were informed of the CDMP and verbal consent obtained for the HCC to contact them. It was stated that: “99% of clients will give verbal consent to be contacted by the HCC about the CDMP”.
- The 48 Hour Follow up Program was co-located with the CDMP contact centre which facilitated integration of the services.
- The programs shared patient information via IT systems, CHIME and Cerner.
• Local Aboriginal population needs were viewed as having been more of a focus within the CDMP since late 2013, with 48 Hour Follow Up sitting in the Health Contact Centre (see Figure 41) with CDMP staff.

• Although the integration of the programs was understood to be potentially beneficial to Aboriginal clients’ care, there had been some resistance from staff relating to the focus of the care being disproportionately on enrolment into the CDMP rather than meeting the 48 Hour Follow Up Program’s objectives and reporting.

CDMP & the ML (WentWest)

• The CDMP had actively integrated with WentWest’s CTG Team through co-funding and co-location of care coordinator positions from the two programs in the ML and these two programs aimed to provide culturally appropriate care and management for Aboriginal people on the CDMP.

• The CTG Team was the Aboriginal health team at WentWest. The team was responsible for the primary care and management of Aboriginal clients referred to the ML for assistance with their chronic disease(s). All Aboriginal CDMP clients stratified to Level 2 (Care Coordination) were referred to WentWest. All Aboriginal CDMP clients were assessed by the CTG team and then stratified into two groups:
  1. Clinical care clients, and
  2. Social and emotional wellbeing clients

• The CTG team aimed to deliver care, which is culturally appropriate, using the structures of the CDMP and the CCSS Program.

• In WentWest, the CTG team and the CDMP Care Coordinators were seen as one team as described by a staff member at WentWest:
  “So on the inside, even people in our organisation think we’re one team”.

• Clinical care clients were managed by Care Coordinators co-funded between the CDMP and the CCSS Program. As a result, many Aboriginal clients were enrolled in both programs. For these patients, the Care Coordination would be provided under CDMP and the financial support and other support services would be provided through supplementary services component of the CCSS Program.

• Social and emotional well-being clients were managed by the CTG Aboriginal outreach workers.

• The organisations had an effective partnership service agreement and clinicians and managers from the CDMP and WentWest communicated at a formal and informal basis described as follows:
  o Formally - Representing their organisations at the CDMP Partnership Committee which oversees governance of the Program and through regular partner meetings to discuss clinical and managerial issues relating to the CDMP,
  o Informally – discussing care and management of clients via telephone, email and fax.

Development of linkages with culturally appropriate Aboriginal chronic disease programs at the Aboriginal Medical Service Western Sydney was ongoing. These linkages are detailed below.

CDMP and the Aboriginal Medical Service Western Sydney

• The Aboriginal Medical Service Western Sydney was not involved in the delivery of the CDMP but had clients enrolled in the Program. These clients were cared for by Went West-based Care Coordinators.

• The CDMP was unfamiliar to staff. The same staff work closely with the Care Coordinators at WentWest and there is a CCSS Program funded position within the ACCHS.

• The Aboriginal Medical Service Western Sydney had chronic disease and lifestyle programs which were promoted to CDMP Aboriginal clients through CDMP or WentWest staff.

• The ACCHS was not involved in the CDMP’s governance. Despite numerous invitations to engage the ACCHS in governance, formal acceptance has not been achieved.
Reach and Access

It was reported that the Program’s reach has been impacted by the following:

- The overall governance of the CDMP
- The location of the 48 Hour Follow-up Program
- The provision of culturally appropriate care through the involvement of a health worker who was a well-respected leader in the local Aboriginal community
- The absence of the Aboriginal Health Unit within the LHD, and
- Maturity of the Program.

Each of these factors influenced how the Program was being delivered to Aboriginal people with chronic disease in Western Sydney. There were further details on each of the points below including the experience from a representative sample of Aboriginal CDMP clients.

Overall governance of the Program

- Overall governance of the Program was viewed as having been unstable. There has been no CDMP Steering Committee since 2010.
- On the other hand there was a formal partnership service agreement between WentWest and the LHD which extended to the CDMP. Aboriginal Health and Chronic Disease were two key priority areas within the agreement.
- There was an active partnership committee with representation from the LHD and WentWest. It was this partnership which oversaw the CDMP in WS LHD. WentWest provided Aboriginal representation on this committee.
- Despite repeated attempts to engage the Aboriginal Medical Service Western Sydney in governance, formal acceptance had not been achieved.
- Operationally, the partnership was viewed to be effective and the CDMP viewed as a vehicle for further developing the partnership.

Location of the 48 hour Follow-up Program

- The 48 Hour Follow-up Program was the major referral source for Aboriginal people to the CDMP. The Program was funded through Blacktown/Mt Druitt hospitals and Aboriginal clients were recruited to the Programs post discharge from these hospitals.

Provision of culturally appropriate care

- LHD staff were trained to ask all people admitted to hospitals or presenting to emergency departments in the District if they were Aboriginal and/or Torres Strait Islander
- The 48 Hour Follow-Up worker was a local, well-respected leader in the Aboriginal community. As stated by the Program Manager of the CDMP:
  “Everybody knows her”. (Program Manager, Connecting Care)
- The 48 Hour Follow Up worker had enabled sound recruitment of CDMP Aboriginal clients directly from the 48-hour follow-up. It was stated by the CDMP Program Manager that about “99% of Aboriginal 48 hour follow-up clients will verbally consent to be contacted about the CDMP”. She also provided support to HCC staff when they liaised with Aboriginal clients during regular CDMP management.
Lack of advocacy for Aboriginal programs in Western Sydney

- In 2012 the Aboriginal Health Unit was restructured out of WS LHD, and at the time of the site visit in late 2013, the Aboriginal Health Unit had not been redeveloped in the LHD.
- The absence of an Aboriginal Health Unit to raise that portfolio for the LHD and the broader community was seen as a barrier to progress.
- CDMP management viewed this as a barrier to developing programs that were effective and provided culturally appropriate care for Aboriginal people in Western Sydney.

Patient experience of the CDMP

Nine Aboriginal patients living in Western Sydney LHD were interviewed and patients were invited to tell their story of engagement (or non-engagement) with the Program. Below is a summary of their experiences.

- Overall, patients had received phone calls regarding the care and management of their chronic diseases.
- Patients sought care from private GPs and occasionally the ACCHS.
- Most were not aware of “being on the Program”, yet described care being provided by health care professionals from the CTG Team at WentWest, the 48 Hour Follow Up Program, Community Health, and other agencies in the local area.
- A small majority of Western Sydney participants were very satisfied with care and reported that they generally had no barriers to care; the remainder reported the need for better support and did not report receiving many services.

Added value (from the health service provider and manager perspective)

CDMP extends care started by the 48 Hour Follow-Up Program

- CDMP staff reported that the CDMP enabled an extension of the care provided through the 48 hour follow-up ensuring longer and sustainable coordinated care and support for the client.

CDMP integrates IT systems across different organisations

- The WentWest Care Coordinator’s reported that the ability to access the IT systems Cerner and CHIME enabled better coordination of care.

CDMP provides opportunity for enhanced communication between different organisations

- It was acknowledged that the Program provided an opportunity for formal and informal communication between care providers within the acute and primary care sector.

3.2.5 Survey of Aboriginal Community Controlled Health Services in NSW

The survey of ACCHSs in NSW was administered to 30 services in November 2013 with a phone and/or email contact. The survey was developed in consultation with the Evaluation Steering Group and covered the following broad areas (See Appendix 5.7 for a copy of the survey tool):

- Service characteristics
- Other programs the ACCHS is involved with
- Receipt of self-management support services and/or care coordination services from outside the ACCHS
- Awareness and use of the CDMP
- Facilitators and barriers to the service and/or patients accessing the Chronic Disease Management Program
- Ways to better integrate the Chronic Disease Management Program with the ACCHS
- Participation of the ACCHS in structures set up at a local or regional level for planning and/or coordination of services for care and management of people with CD

Follow Up

Non-responders were followed up electronically three times with email reminders through Survey Monkey, and then by phone.

Responding ACCHSs – Service characteristics

Of the 30 ACCHSs administered the survey, 11 services completed the survey (including an organisational consent form to participate in the survey).90 These services were from a variety of LHDs91 and operate five days and week and are a mix of sizes:

- 3 had 1-20 staff
- 6 had 21 – 50 staff
- 2 had 51 – 100 staff

The survey was completed by a variety of different staff members (detailed in Table 18 below).

Table 18 Role of person completing the Survey of Aboriginal Community Controlled Health Services

<table>
<thead>
<tr>
<th>Role of person completing the survey</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO</td>
<td>1</td>
</tr>
<tr>
<td>Practice Manager</td>
<td>4</td>
</tr>
<tr>
<td>Doctor</td>
<td>1</td>
</tr>
<tr>
<td>AHW</td>
<td>1</td>
</tr>
<tr>
<td>Nurse</td>
<td>2</td>
</tr>
<tr>
<td>Allied Health Worker</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

90 One additional service completed a small number of questions at the beginning of the survey so results for this service are not included in this analysis.

91 ACCHSs completing the survey were from the following LHDs: Western NSW LHD, Murrumbidgee LHD, Northern NSW LHD, Southern NSW LHD, Hunter New England LHD, and Illawarra LHD.
Diagnosis and treatment of Chronic Disease

All responding ACCHSs diagnose and treat chronic disease and all but one had a chronic disease program.

Other programs the responding ACCHS is involved with

ACCHSs were asked if they were involved with the following programs run by NSW Health and the Commonwealth Department of Ageing:

- NSW Health Chronic Care Enhancements
- NSW Health Chronic Care for Aboriginal People – 48 Hour Follow Up Program
- NSW Health Chronic Care for Aboriginal People – One Deadly Step
- NSW Health Chronic Disease Management Program
- NSW Health Get Healthy Information and Coaching Service
- Australian Government CCSS Program
- Australian Government Healthy for Life Program

Of the 11 responding ACCHSs, eight noted involvement in the CCSS Program, six reported involvement in the Healthy for Life Program, five reported involvement in both the Chronic Care Enhancements Program and the CDMP, and four reported involvement in the Chronic Care for Aboriginal People 48 Hour Follow Up Program. A small number of responding services reported involvement with the Chronic Care for Aboriginal People One Deadly Step Program and the Get Healthy Information and Coaching Service (two services respectively).

Receipt of self-management support and care coordination services from outside of the Service

As self-management support and care coordination are the two interventions of the CDMP, the Evaluation Team was interested to learn if ACCHSs receive self-management support or care coordination services for their patients from outside the service.

Self-management support

Of the 11 responding ACCHSs, seven reported receiving self-management support services for their patients from external sources such as: allied health service providers, Home and Community Care service providers, through the CDMP or the ML, and from diabetes service providers. One responding ACCHS reported that only a small proportion of patients needing rehabilitation services (cardiac or respiratory) actually received them.

Care-coordination support

Of responding ACCHSs, more reported receiving care coordination support from outside the ACCHS for their patients than reported receiving self-management support – nine of the 11 responding services. Care coordination services were received from a variety of different sources including from: GPs, AHWs, through the CCSS Program, and through the ML.

Knowledge and Use of the Chronic Disease Management Program

Over half of responding ACCHSs had heard of the CDMP. Of the 6 responding ACCHSs that had heard of the Program, 4 had an identified contact person and the same number had made referrals into the Program (with good knowledge of target conditions). The six responding ACCHSs had reasonable knowledge that the Program can provide self-management support (4 were aware the Program can provide this service, one not aware, and one ACCHS reported they did not know) and/or care coordination (3 ACCHSs were aware the Program can provide this service, two ACCHSs were not, and one ACCHS reported they did not know) for their patients.
Barriers and facilitators to working with the Chronic Disease Management Program

The five ACCHSs that responded to this question noted a number of barriers and facilitators to the service working with the CDMP. Secure messaging or communication between services was seen as a necessary facilitator to the ACCHS working with the Program, and the absence of secure messaging or communication between services was seen as a barrier to ACCHSs working with the Program. There being accessibility to the CDMP from within an ACCHS was seen as a facilitator, as was more contact with the CDMP. Lack of feedback to an ACCHS once a referral had been made to the Program was seen as a barrier to a service working with the CDMP, as was confusion about services and programs in general.

How the Chronic Disease Management Program can better integrate with an ACCHS’s activities

When asked how the CDMP can better integrate with an ACCHS’s activities, five services responded. They noted the following as ways in which the CDMP can better integrate with the ACCHS’s activities:

- Improved referral processes
- Improved linkage of electronic systems and utilizing and encouraging active registration in the Personally Controlled Electronic Health Record, and allowing referrals and reports to be sent back and forth electronically and copies sent to the clients Personally Controlled Electronic Health Record
- Having care coordination positions for the CDMP created within ACCHSs

Planning of Chronic Disease services at a local and/or regional level

The 11 ACCHSs that completed the survey completed the section on planning of chronic disease services at a local and/or regional level. The majority of responding ACCHSs were involved in local/regional meetings for the planning of services for care and management of people with chronic disease – generally with either the LHD (n=7) or the ML (n=8); a small minority of responding ACCHSs were involved in such meetings with the two organisations together (n=3). Further to this, more responding ACCHSs received regular updates or communications related to chronic disease from MLs (n=8) than from LHDs (n=7).

3.3 Characteristics of CDMP participants

3.3.1 The Evaluation cohort

As previously discussed, the analysis focused on only part of the CDMP cohort available in the CDMP OR. Participants without a derived enrolment date could not be included because exposure to the Program could not be ascertained. Also, in collaboration with the Evaluation Steering Group, the decision was taken to consider enrolment from January 2011 as providing participants with exposure to discernible elements of the Program. These exclusions resulted in a relatively small loss to the cohort, as illustrated in Figure 42 below, and define the Evaluation cohort.
The CDMP cohort available for matched analyses

For the purposes of matching and comparative evaluation, the CDMP Evaluation cohort was refined as outlined in Figure 43 below. For the matched analysis only CDMP participants who had at least one hospital/ED episode in the 12 months preceding their enrolment were able to be included. The vast majority of the enrolled cohort who survived beyond their month of enrolment had at least one acute service event in the 12 months prior to enrolment, and were able to be matched to a control group member. For the analysis, only survivors for the period of the Evaluation beyond enrolment were included, representing two thirds of the Evaluation cohort who survived beyond their month of enrolment.

Figure 43 Derivation of the CDMP cohort for matching purposes

*survived until the end of the evaluation period, from enrolment.

Figure 44 below shows the enrolment pattern for CDMP participants over the years of the evaluation period. It shows that enrolments peaked in 2012, with the lowest enrolment levels by a small margin in 2013. For all LHDs the majority of enrolments occurred after January 2012 (Figure 45).

Figure 44 CDMP Evaluation cohort Enrolments by year (n=41,303)
Figure 45 Enrolments by LHD and year of enrolment for the CDMP Evaluation cohort (n=41,303)

Table 19 below shows that the size of the Evaluation cohort in each LHD varies considerably. These variations are in line with expected enrolments across NSW.

Table 19 CDMP Evaluation cohort by LHD and year of enrolment

<table>
<thead>
<tr>
<th>LHD</th>
<th>2011 Number (%)</th>
<th>2012 Number (%)</th>
<th>2013 Number (%)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CENTRAL COAST</td>
<td>1355 (10.2%)</td>
<td>977 (6.3%)</td>
<td>1168 (9.4%)</td>
<td>3500 (8.5%)</td>
</tr>
<tr>
<td>FAR WEST</td>
<td>23 (0.2%)</td>
<td>18 (0.1%)</td>
<td>58 (0.5%)</td>
<td>99 (0.2%)</td>
</tr>
<tr>
<td>HUNTER NEW ENGLAND</td>
<td>2196 (16.5%)</td>
<td>1435 (9.3%)</td>
<td>1717 (13.8%)</td>
<td>5348 (12.9%)</td>
</tr>
<tr>
<td>ILLAWARRA SHOALHAVEN</td>
<td>2684 (20.1%)</td>
<td>1940 (12.5%)</td>
<td>1408 (11.3%)</td>
<td>6032 (14.6%)</td>
</tr>
<tr>
<td>MID NORTH COAST</td>
<td>574 (4.3%)</td>
<td>663 (4.3%)</td>
<td>345 (2.8%)</td>
<td>1582 (3.8%)</td>
</tr>
<tr>
<td>MURRUMBIDGEE</td>
<td>106 (0.8%)</td>
<td>371 (2.4%)</td>
<td>546 (4.4%)</td>
<td>1023 (2.5%)</td>
</tr>
<tr>
<td>NEPEAN BLUE MOUNTAINS</td>
<td>222 (1.7%)</td>
<td>730 (4.7%)</td>
<td>763 (6.1%)</td>
<td>1715 (4.2%)</td>
</tr>
<tr>
<td>NORTHERN NSW</td>
<td>745 (5.6%)</td>
<td>627 (4.0%)</td>
<td>301 (2.4%)</td>
<td>1673 (4.1%)</td>
</tr>
<tr>
<td>NORTHERN SYDNEY</td>
<td>689 (5.2%)</td>
<td>2684 (17.3%)</td>
<td>943 (7.6%)</td>
<td>4316 (10.4%)</td>
</tr>
<tr>
<td>SOUTH EASTERN SYDNEY</td>
<td>2806 (21.1%)</td>
<td>2543 (16.4%)</td>
<td>2059 (16.5%)</td>
<td>7408 (17.9%)</td>
</tr>
<tr>
<td>SOUTH WESTERN SYDNEY</td>
<td>0 (0.0%)</td>
<td>3 (0.0%)</td>
<td>219 (1.8%)</td>
<td>222 (0.5%)</td>
</tr>
<tr>
<td>SOUTHERN NSW</td>
<td>76 (0.6%)</td>
<td>260 (1.7%)</td>
<td>632 (5.1%)</td>
<td>968 (2.3%)</td>
</tr>
<tr>
<td>SYDNEY</td>
<td>168 (1.3%)</td>
<td>652 (4.2%)</td>
<td>275 (2.2%)</td>
<td>1095 (2.7%)</td>
</tr>
<tr>
<td>WESTERN NY</td>
<td>378 (2.8%)</td>
<td>900 (5.8%)</td>
<td>690 (5.5%)</td>
<td>1968 (4.8%)</td>
</tr>
<tr>
<td>WESTERN SYDNEY</td>
<td>1302 (9.8%)</td>
<td>1699 (11.0%)</td>
<td>1353 (10.8%)</td>
<td>4354 (10.5%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>13,324 (100.0%)</td>
<td>15,502 (100.0%)</td>
<td>12,477 (100.0%)</td>
<td>41,303 (100.1%)</td>
</tr>
</tbody>
</table>
3.3.2 Characteristics of CDMP participants – overall

Demographic characteristics of the CDMP Evaluation cohort remained reasonably stable over the evaluation period showing:

- The cohort was evenly split by sex
- The cohort was largely older participants, with nearly half of participants >= 75 years of age
- Approximately 5% of participants were reported as Aboriginal, in line with enrolment targets set for the Program
- The vast majority of participants came from major cities, although most ARIA classifications were represented in the cohort
- Participants could most commonly be classified as moderately disadvantaged on the SEIFA disadvantage scale, with approximately one quarter classified as being in the 3 most disadvantaged deciles.

See Figure 46 below for an overview schematic of the demographic characteristics of the CDMP Evaluation cohort, and Table 20 for an overview of demographic characteristics by year of enrolment for the CDMP Evaluation cohort.

Figure 46 Demographic characteristics of Evaluation cohort (n=41,303)
### Table 20 Demographic characteristics by year of enrolment for the CDMP Evaluation cohort (n=41,303)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (at enrolment) bands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/Missing</td>
<td>12599/725</td>
<td>14803/699</td>
<td>11782/695</td>
<td>39184/2119</td>
</tr>
<tr>
<td>&lt;50 years</td>
<td>1190 (9.4%)</td>
<td>1509 (10.2%)</td>
<td>1011 (8.6%)</td>
<td>3710 (9.5%)</td>
</tr>
<tr>
<td>50 - &lt;65 years</td>
<td>2468 (19.6%)</td>
<td>3182 (21.5%)</td>
<td>2510 (21.3%)</td>
<td>8160 (20.8%)</td>
</tr>
<tr>
<td>65 - &lt;75 years</td>
<td>3186 (25.3%)</td>
<td>3741 (25.3%)</td>
<td>3054 (25.9%)</td>
<td>9981 (25.5%)</td>
</tr>
<tr>
<td>&gt;=75 years</td>
<td>5755 (45.7%)</td>
<td>6371 (43.0%)</td>
<td>5207 (44.2%)</td>
<td>17333 (44.2%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/Missing</td>
<td>13300/24</td>
<td>15479/23</td>
<td>12475/2</td>
<td>41254/49</td>
</tr>
<tr>
<td>Female</td>
<td>6989 (52.5%)</td>
<td>8077 (52.2%)</td>
<td>6481 (52.0%)</td>
<td>21547 (52.2%)</td>
</tr>
<tr>
<td>Male</td>
<td>6309 (47.4%)</td>
<td>7396 (47.8%)</td>
<td>5989 (48.0%)</td>
<td>19694 (47.7%)</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Not known</td>
<td>2 (0.0%)</td>
<td>6 (0.0%)</td>
<td>5 (0.0%)</td>
<td>13 (0.0%)</td>
</tr>
<tr>
<td>Aboriginality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/Missing</td>
<td>13324/0</td>
<td>15502/0</td>
<td>12475/2</td>
<td>41301/2</td>
</tr>
<tr>
<td>Aboriginal but not Torres Islander</td>
<td>674 (5.1%)</td>
<td>780 (5.0%)</td>
<td>670 (5.4%)</td>
<td>2124 (5.1%)</td>
</tr>
<tr>
<td>Torres Islander but not Aboriginal</td>
<td>9 (0.1%)</td>
<td>12 (0.1%)</td>
<td>11 (0.1%)</td>
<td>32 (0.1%)</td>
</tr>
<tr>
<td>Both Aboriginal and Torres Islander</td>
<td>27 (0.2%)</td>
<td>22 (0.1%)</td>
<td>16 (0.1%)</td>
<td>65 (0.2%)</td>
</tr>
<tr>
<td>Neither Aboriginal nor Torres Islander</td>
<td>12412 (93.2%)</td>
<td>14187 (91.5%)</td>
<td>11451 (91.8%)</td>
<td>38050 (92.1%)</td>
</tr>
<tr>
<td>Declined to respond</td>
<td>2 (0.0%)</td>
<td>6 (0.0%)</td>
<td>1 (0.0%)</td>
<td>9 (0.0%)</td>
</tr>
<tr>
<td>Not known</td>
<td>200 (1.5%)</td>
<td>495 (3.2%)</td>
<td>326 (2.6%)</td>
<td>1021 (2.5%)</td>
</tr>
<tr>
<td>ARIA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/Missing</td>
<td>13289/35</td>
<td>15460/42</td>
<td>12460/17</td>
<td>41209/94</td>
</tr>
<tr>
<td>Inner Regional Australia</td>
<td>3115 (23.4%)</td>
<td>3335 (21.6%)</td>
<td>2985 (24.0%)</td>
<td>9435 (22.9%)</td>
</tr>
<tr>
<td>Major Cities of Australia</td>
<td>9572 (72.0%)</td>
<td>11204 (72.5%)</td>
<td>8456 (67.9%)</td>
<td>29232 (70.9%)</td>
</tr>
<tr>
<td>Outer Regional Australia</td>
<td>558 (4.2%)</td>
<td>869 (5.6%)</td>
<td>926 (7.4%)</td>
<td>2353 (5.7%)</td>
</tr>
<tr>
<td>Remote Australia</td>
<td>41 (0.3%)</td>
<td>51 (0.3%)</td>
<td>91 (0.7%)</td>
<td>183 (0.4%)</td>
</tr>
<tr>
<td>Very Remote Australia</td>
<td>3 (0.0%)</td>
<td>1 (0.0%)</td>
<td>2 (0.0%)</td>
<td>6 (0.0%)</td>
</tr>
<tr>
<td>SEIFA - disadvantaged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/Missing</td>
<td>13284/40</td>
<td>15454/48</td>
<td>12457/20</td>
<td>41195/108</td>
</tr>
<tr>
<td>Most disadvantaged(1-3)</td>
<td>3591 (27.0%)</td>
<td>3624 (23.5%)</td>
<td>3210 (25.8%)</td>
<td>10425 (25.3%)</td>
</tr>
<tr>
<td>Moderately disadvantaged(4-7)</td>
<td>7043 (53.0%)</td>
<td>6988 (45.2%)</td>
<td>6472 (52.0%)</td>
<td>20503 (49.8%)</td>
</tr>
<tr>
<td>Least disadvantaged(8-10)</td>
<td>2650 (19.9%)</td>
<td>4842 (31.3%)</td>
<td>2775 (22.3%)</td>
<td>10267 (24.9%)</td>
</tr>
</tbody>
</table>

### 3.3.3 Characteristics of Aboriginal participants in the CDMP

Both the APDC and the MDS data included flags for reporting of Aboriginal patients. Very little discrepancy was evident between patients reported as Aboriginal in the MDS and in the APDC (Table 21). Taking the most
inclusive interpretation of the data flags, where the presence of an identifier in either data set was included, there is a total of 2,423 Aboriginal participants in the CDMP Evaluation cohort.

Table 21 Aboriginal CDMP participants flagged in the MDS and in the APDC

<table>
<thead>
<tr>
<th>Flag from MDS</th>
<th>Flag from Hospitalisation/ED data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>38753</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2423 (5.8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The distribution of Aboriginal Participants by LHD is shown in Table 22 below:

Table 22 Aboriginal Evaluation cohort (n=2423 of 41,303)

<table>
<thead>
<tr>
<th>LHD</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>CENTRAL COAST</td>
<td>168</td>
</tr>
<tr>
<td>FAR WEST</td>
<td>13</td>
</tr>
<tr>
<td>HUNTER NEW ENGLAND</td>
<td>528</td>
</tr>
<tr>
<td>ILLAWARRA SHOALHAVEN</td>
<td>244</td>
</tr>
<tr>
<td>MID NORTH COAST</td>
<td>198</td>
</tr>
<tr>
<td>MURRUMBIDGEE</td>
<td>41</td>
</tr>
<tr>
<td>NEPEAN BLUE MOUNTAINS</td>
<td>123</td>
</tr>
<tr>
<td>NORTHERN NSW</td>
<td>129</td>
</tr>
<tr>
<td>NORTHERN SYDNEY</td>
<td>38</td>
</tr>
<tr>
<td>SOUTH EASTERN SYDNEY</td>
<td>162</td>
</tr>
<tr>
<td>SOUTH WESTERN SYDNEY</td>
<td>6</td>
</tr>
<tr>
<td>SOUTHERN NSW</td>
<td>38</td>
</tr>
<tr>
<td>SYDNEY</td>
<td>18</td>
</tr>
<tr>
<td>WESTERN NSW</td>
<td>350</td>
</tr>
<tr>
<td>WESTERN SYDNEY</td>
<td>367</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2423</td>
</tr>
</tbody>
</table>

The Aboriginal participants in the CDMP Evaluation cohort (as reported in the APDC) had different demographic characteristics to the CDMP Evaluation cohort overall. As expected, the Aboriginal participants were:

- Younger, most commonly (50 – 65 years)
- Most commonly classified as being in the most disadvantaged SEIFA categories.

See Figure 47 for an overview of the demographic characteristics of the Aboriginal Evaluation cohort:
3.3.4 Characteristics of CDMP participants who received external telephone coaching

A total of 1529 CDMP participants enrolled in Healthways during the evaluation period were flagged in the Evaluation cohort. Table 23 shows that Healthways telephone coaching was provided in 3 LHDs primarily (HNE, ISH, SES), each referring between 400 and 600 patients, evenly split over 2012 and 2013.

Table 23 Healthways cohort by LHD and year of enrolment into Healthways

<table>
<thead>
<tr>
<th>LHD</th>
<th>2011 Number (%)</th>
<th>2012 Number (%)</th>
<th>2013 Number (%)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CENTRAL COAST</td>
<td>0 (0.0%)</td>
<td>1 (0.1%)</td>
<td>0 (0.0%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>HUNTER NEW ENGLAND</td>
<td>0 (0.0%)</td>
<td>203 (26.9%)</td>
<td>206 (26.9%)</td>
<td>409 (26.7%)</td>
</tr>
<tr>
<td>ILLAWARRA SHOALHAVEN</td>
<td>1 (14.3%)</td>
<td>261 (34.5%)</td>
<td>278 (36.3%)</td>
<td>540 (35.3%)</td>
</tr>
<tr>
<td>SOUTH EASTERN SYDNEY</td>
<td>6 (85.7%)</td>
<td>290 (38.4%)</td>
<td>281 (36.7%)</td>
<td>577 (37.7%)</td>
</tr>
<tr>
<td>SYDNEY</td>
<td>0 (0.0%)</td>
<td>1 (0.1%)</td>
<td>0 (0.0%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>WESTERN SYDNEY</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (0.1%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>7 (100.0%)</strong></td>
<td><strong>756 (100.0%)</strong></td>
<td><strong>766 (100.0%)</strong></td>
<td><strong>1529 (100.0%)</strong></td>
</tr>
</tbody>
</table>

Inspection of the demographic characteristics of the sub-group of participants who received the six-month Healthways telephone coaching intervention revealed some key similarities and differences in this sub-group, compared with the whole CDMP cohort:
• A younger cohort than the CDMP cohort overall, with the majority of participants < 65 years of age
• Like the whole cohort, Healthways participants were most commonly classified in the moderately disadvantaged categories of the SEIFA disadvantage scale
• Like the whole cohort, Healthways participants were equally split by sex
• Like the whole cohort, approximately 5% of Healthways participants were reported as Aboriginal.

An overview of the demographic characteristics of the Healthways cohort is shown in Figure 48 below:

Figure 48 Demographic characteristics of the Healthways cohort

Demographic characteristics of Healthways cohort

3.4 Health service utilisation

3.4.1 Overview of service utilisation of CDMP participants

Potentially preventable admissions, re-admissions and emergency presentations

The CDMP participants in the Evaluation cohort were, unsurprisingly, frequent users of acute services (Figure 49). In the year prior to enrolment, nearly half of CDMP participants had multiple admissions, multiple potentially preventable admissions and multiple ED presentations.
Figure 49 Overview of service utilisation of the Evaluation cohort (n=41,303) in the year before enrolment

3.4.2 Natural history of mortality and service utilisation of the CDMP cohort and the Control cohort between 2007 and 2013 – unmatched analyses

Mortality

The monthly rate of death in the two cohorts, the CDMP participants and the control cohort comprising patients admitted at least once for one of the target diseases, is shown in Figure 50. This excludes anyone who died before January 2011. The proportion of deaths by month from 2011 follows a similar rise in each cohort. The pattern of mortality in Figure 50 suggests that the CDMP cohort was not comprised of patients closer to death than the control cohort.
Potentially preventable hospital admissions/readmissions and emergency presentations

For outcomes defined as number of events (potentially preventable hospital admissions, potentially preventable readmissions and ED presentations), monthly rates and their 95% CI were calculated for each month between January 2007 and November 2013. Death was considered as a censoring event, so that patients who died in a given month were removed from the data. Again, those who had died before January 2011 were excluded from the Control cohort. The three outcome measures show the same pattern. Figure 51, Figure 52 and Figure 53 suggest that:

- CDMP participants had higher levels of service utilisation throughout which increased over time, and particularly increasing from 2011 onwards.
- While consistently lower and much more stable, the monthly rate of utilisation appeared to increase slightly over the evaluation period, that is from 2011 onwards, in the Control cohort as well.
Figure 51 Monthly rate of potentially preventable hospitalisations in the CDMP (orange) cohort (N= 41,303) and control (grey) cohort (N= 526,876)

Figure 52 Monthly rate of Emergency Department presentations in the CDMP (orange) cohort and control (grey) cohort (N= 526,876)
3.4.3 Matched analyses

Propensity Scoring

The data of primary interest for the Evaluation were those able to be compared against plausible control cases. Propensity scoring was used to establish ‘matched controls’ from the available control cohort of patients in the CDMP OR. It will be recalled that all patients admitted at least once for one of the five CDMP target conditions between 2007 and 2013 are included in the CDMP OR.

The propensity scoring process allowed the creation of a cohort of matched controls against which to compare the outcomes of the CDMP participants. The four main outcomes selected for consideration at this point in the analysis were potentially preventable admissions, potentially preventable re-admissions, ED presentations and potentially preventable bed days. While these outcomes do not represent the full suite of potential outcomes, they address key metrics to understand the impact of program participation.

Service utilisation at the cohort level over time

The average yearly rate of all hospital admissions (and their confidence limits) was derived for both cohorts before and after matching on the basis of propensity score.

First, for each CDMP participant, the outcome was the yearly rate of utilisation between the month of enrolment and the end of the evaluation period (30 November 2013). Each CDMP participant thus contributed only one data point, that is their annual rate, post enrolment from their month of enrolment.

To assess the potential effect of time on the Program i.e. whether future rates of service utilisation differ depending on when a participant was enrolled into the Program, we broke down the analysis by month of enrolment.

The annual utilisation rate for the entire Control cohort over the same periods was also plotted.
Figure 54 shows the average annual rate of hospital admission before matching. It shows that, over the evaluation period, there was a consistent excess in the rate of hospitalisation among the CDMP participants (orange) compared to the control cohort (grey). The pattern over time among the CDMP cohort was a volatile but overall a flat trend was evident. In contrast, the trend for the Control cohort was very stable, but steadily increasing over time.

Figure 54 All hospital admissions - unmatched – for the entire CDMP (orange) cohort (N= 41,303) and the control (grey) cohort (N= 526,876)

Figure 55 shows the average annual rate of all hospitalisation between enrolment month and end of the evaluation period, by month of enrolment, after matching based on propensity score. The ‘month of enrolment’ for the control cohort is the month in which the patient was matched to a CDMP participant. Both cohorts only contribute one data point, the yearly utilisation between the month of enrolment/matching and the end of the Evaluation.

There is very little difference between the two cohorts, either in rate or pattern of all hospitalisation after matching. First and foremost, this indicates the importance of comparing like with like in the following analyses, and the potentially misleading findings of unmatched/ uncontrolled comparisons.
Figure 55 All hospital admissions for the matched survivor CDMP (orange) cohort (N= 26,208) and control (grey) cohort (N=26,187)

Figure 56, Figure 57, Figure 58 and Figure 59 show average annual rates (and confidence limits) of potentially preventable admissions, potentially preventable readmissions, emergency presentations and potentially preventable bed days before and after the matching process based on the propensity scoring method.

Again, rates were derived for the entire CDMP cohort between month of enrolment and the end of the evaluation period, and for the entire Control cohort between each of the same months and the end of the evaluation period (refer to Methodology Section 2.3.5 Analysis methods for further details). After matching, the ‘month of enrolment’ for the control cohort is the month in which the patient was matched to a CDMP participant.

For all outcomes, the difference between the matched CDMP and control cohorts for each enrolment month of the evaluation period (Jan 11 – Oct 13) was analysed. For the unmatched analyses 32,070 CDMP participants and 460,385 control participants were included for the analysis. After restricting the analysis to survivors, denominators became 27,391 and 392,722 respectively. For the matched analyses, 30,746 participants were included in each cohort for the analyses. After restricting the matched analysis to survivors, the denominators became 26,208 and 26,187 in the CDMP and Control cohorts respectively.

The matched and unmatched rates are presented together with the statistical analysis relating to the overall difference between the two matched cohorts. For each outcome, the number of patients featuring in the analysis is as above (unmatched CDMP cohort: N= 41, 303; unmatched control cohort: N= 526,876; matched survivor CDMP cohort: N= 26,208; matched survivor control cohort: N = 26,187).

Figure 56 shows rate of potentially preventable admissions before and after matching in the CDMP and Control cohorts and the modelled differences between the two matched cohorts.
Figure 56 Potentially preventable admissions in the CDMP (orange) and Control (grey) cohorts after enrolment – before matching, after matching, and the modelled differences between the two matched cohorts.
Taken together, these analyses suggest the following:

1. Before matching, potentially preventable admissions in the two cohorts show marked differences in average annual rate and pattern over time; after matching the two cohorts are more similar.
2. After matching, the CDMP cohort shows a consistent excess, for every month of enrolment, in average yearly rate of potentially preventable admissions (overall difference: 0.29 potentially preventable hospitalisations per year, p < .001).
3. The pattern over time after matching appears to be similar for both cohorts: yearly rate of potentially preventable admissions appears to increase gradually for both cohorts over time.

Figure 57, Figure 58 and Figure 59 show the other measures of outcome available to the Evaluation. The same pattern of findings can be seen. Before matching, substantial differences are evident between the CDMP and control cohorts in both average annual rates and patterns of rates over time. After matching, a persistent excess of event rates in the CDMP cohort is evident (p<.001), with both cohorts showing a similar pattern over time – either reasonably flat or slightly increasing.
Figure 57 Potentially preventable readmissions (unplanned admission followed by an potentially preventable readmission) in the CDMP (orange) and Control (grey) cohorts after enrolment - before matching, after matching, and modelled differences between the two matched cohorts.
Average yearly rate of avoidable readmissions between enrolment month and end of study

Entire cohort - Survivors only - After matching

Difference (95% CI): 0.066 (0.054; 0.078)

p-value <.001
Figure 58 Emergency Department presentations in the CDMP (orange) cohort and the control (grey) cohort following enrolment - before and after matching, and modelled differences between the two matched cohorts.
Figure 59 Potentially preventable bed days in the entire CDMP (orange) cohort and the control (grey) cohort following enrolment - before and after matching, and modelled differences between the two matched cohorts.
Yearly average of avoidable bed days between enrolment month and end of study

Entre cohort - Survivors only - After matching

Difference (95% CI): 1.968 (1.730; 2.205)
p-value <.001
Service utilisation at the individual level over time

Matched analyses were used to consider changes in service use after enrolment in CDMP, compared to before enrolment. For CDMP and matched Control cohort patients, the monthly rate of service use was calculated for each month. The month of enrolment/matching was designated as time zero. Each month before and after time zero reflects elapsed time before or after enrolment/matching for each patient, with average rates and confidence intervals calculated for each month to provide the description of longitudinal patterns for each cohort. The “Pre-enrolment/matching” period ranges between 48 months for those enrolled/matched in January 2011 and 81 months for those enrolled/matched in October 2013. The “Post-enrolment/matching” period ranges between 1 month for those enrolled/matched in October 2013 and almost 35 months for those enrolled/matched in January 2011. For each month, the denominator reflects the number of participants alive and in the study at that time point. Plots were truncated at -78 and 30 months to exclude periods with negligible numbers of participants (and thus very wide confidence intervals).

Figure 60 shows the monthly rate (and confidence limits) of hospitalisation for each month before and after enrolment. The figure shows that:

- The monthly rate and pattern of hospital admissions was virtually identical for CDMP and Control cohort patients.
- The monthly rate of admission for both cohorts increased steadily in the years prior to enrolment, until the year before enrolment, when the monthly rate of admissions increased sharply.
- Enrolment occurred at the peak of utilisation in the pre-enrolment period (4 to 7 years) for which data were available.
- Admissions declined sharply immediately following enrolment for both cohorts, and then continued to decrease more gradually over the post enrolment period.

Figure 60 Monthly average of all hospital admissions for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 61 shows the monthly rate of unplanned hospitalisation for the CDMP participants (orange) and the matched Control cohort members (grey) with time zero being the time of enrolment/matching. Each month before and after represents elapsed time before and after enrolment for each patient. The figure shows the monthly rate of hospitalisation for each month. The figure indicates that:

- The pattern of monthly rate of unplanned hospitalisation was identical for both cohorts: a gradual rise in the years preceding enrolment, a sharp increase in the 12 months immediately preceding enrolment peaking at the time of enrolment, followed by an immediate sharp decrease, and then a gradual decrease over time.
- Up to the point of enrolment, the monthly rate of unplanned admissions was virtually identical for both cohorts, attesting to the strength of the matching process.
- Post-enrolment, there was a consistent excess in the monthly rate of unplanned hospital admission among CDMP participants compared to Control cohort members.

Figure 61 Monthly average of unplanned admissions for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/matching (numbers below the X axis indicate patient numbers in each cohort at each time point)

The same longitudinal analysis was undertaken for all other outcome measures: potentially preventable admissions, potentially preventable re-admissions, emergency presentations and potentially preventable bed days. As previously, matched analyses were used to consider changes in service use after enrolment in CDMP, compared to before enrolment. For surviving CDMP and matched Control cohort patients, the monthly rate of service use was calculated for each month. The month of enrolment/matching was designated as time zero. Each month before and after time zero reflects elapsed time before or after enrolment/matching for each patient, with average rates and confidence intervals calculated for each month to provide the description of longitudinal patterns for each cohort.

Figure 62, Figure 63 and Figure 64 show the monthly rate of potentially preventable admissions, potentially preventable re-admissions, potentially preventable bed days and emergency department presentations. All outcome measures show the same pattern as unplanned admissions:
A gradually rise in the years preceding enrolment with a sharp increase in the 12 months before enrolment, peaking at the time of enrolment

An immediate sharp decrease post enrolment, and then more gradual decrease over time

A consistent excess in the monthly rate of potentially preventable admissions among CDMP participants post enrolment, compared to Control cohort members

Figure 62 Monthly average of potentially preventable admissions for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 63 Monthly average of potentially preventable bed-days for the matched CDMP (orange) and Control (grey) cohorts before and after enrolment/matching (numbers below the X axis indicate patient numbers in each cohort at each time point).
Matching quality

One possible explanation of the consistent excess of service use by CDMP participants might be the quality of matching. The quality of the matching was formally assessed using plots and standardised differences, which is the recommended metric. Although there is no agreed criterion, a standardized difference comprised between -0.1 and 0.1 is considered negligible.

Overall, the results confirm that the set of matched variables is very well balanced, and that very good matching was achieved, with only a small imbalance for two of the smaller LHDs slightly exceeding negligible levels of standardized difference (0.22 and 0.11, respectively).

Notably, the matched-analyses models also included adjustment on key baseline variables (even though they were already used in the propensity score/matching). This strategy provides additional robustness to the analysis.

Figure 65 and Figure 66 depict the quality of the matching achieved in the analyses. They indicate a high level of overlap in the distribution of characteristics (ie balance) in the two cohorts after matching. Further consideration of matching quality can be found in Appendix 5.8.
**Figure 65 Distribution of categorical characteristics after matching**

<table>
<thead>
<tr>
<th>Category</th>
<th>Control</th>
<th>CDMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED emergency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED non-urgent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED resuscitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED semi-urgent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED urgent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
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<tr>
<td>LHD</td>
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<td></td>
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<tr>
<td>Marital status</td>
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</tr>
<tr>
<td>Obesity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal disease</td>
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<td></td>
</tr>
<tr>
<td>Respiratory disease</td>
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</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 66 Distribution of continuous characteristics after matching
Mortality

An alternative explanation for the consistent excess of CDMP participant service utilisation might be related to mortality rate. It is well demonstrated that utilisation is inevitably elevated in the last 12 months of life. If CDMP participants were more likely to be in the last year of life during enrolment, this might account for the consistently higher utilisation of participants after enrolment.

Figure 67 below shows the monthly rate of death for matched CDMP and Control cohorts, relative to time of enrolment in the Program. Time zero is the point of enrolment (and therefore matching). It shows the same rate and pattern for both cohorts. The monthly rate of death increases sharply with time after enrolment/matching, unsurprisingly, given the age of the two cohorts.

Figure 67 Matched analysis of death for members of the CDMP (orange) and Control (grey) cohorts before and after enrolment (number of cohort members across time shown under the X axis)

Proximity to death at the time of enrolment/matching was further examined. Annual death rates were derived for the entire CDMP cohort (orange) between month of enrolment and the end of the evaluation period, and for the entire Control cohort (grey) between each of the same months and the end of the evaluation period. After matching, the ‘month of enrolment’ for the control cohort is the month in which the patient was matched to a CDMP participant. Figure 68 confirms that there were no statistical differences in the rate of death for the two cohorts: CDMP participants were not more likely to be in their last year of life than the matched Control cohort.

92 Rosenwax LK, McNamara BA, Murry K, McCabe RJ, Aoun SM, Currow DC. Hospital emergency department use in the last year of life: a baseline for future modifications to end-of-life care. MJA 2011; 194: 570-573.
3.4.4 The impact on service utilisation of receiving external telephone coaching

In all, 1522 CDMP participants were flagged in the Evaluation cohort as receiving the Healthways telephone coaching service between January 2012 and December 2013 in 3 LHDs (Hunter New England, Illawarra Shoalhaven and South Eastern Sydney). Of these, 1,244 did not die within a month of Healthways enrolment and experienced an encounter with the acute system (as an inpatient or as an emergency presentation) in the 12 months prior to their enrolment in the CDMP, the outcome variable for matching purposes. After matching to controls, 1,111 Healthways participants enrolled in 2012 and 2013 were included, 1,088 of whom survived until the end of the evaluation period (November 2013).

The control cohort was drawn from the available control cohort of patients in the CDMP OR who were never enrolled in the CDMP, using propensity scoring to match participants in the two cohorts.

The impact of service utilisation at the cohort level was considered in six-month epochs, rather than monthly, to allow for the smaller number of participants available for analysis.

The quality of the matching achieved was overall very high; however a few imbalances (SD>0.1) remained including the rate of potentially preventable admissions in the last 3 months (SD=0.13), the prevalence of dementia (SD=0.23), the prevalence of renal disease (0.15), marital status (SD= 0.13) and age (SD=0.17).

Figure 69, Figure 70, Figure 71 and Figure 72 show the results of the matched analyses of rates of service utilisation for the two cohorts, those receiving the Healthways intervention (from the beginning of their participation in the Healthways intervention rather than enrolment in the CDMP) and the matched controls participants who did not participate in the CDMP. Healthways participants who started receiving the Healthways intervention in a given month were matched to a control participant who had a similar propensity
score at that time, i.e. a similar profile in terms of past service utilisation, comorbidities and socio-demographic characteristics.

Average annual service utilisation rates were derived between the end of the month in which the Healthways intervention commenced and the end of the evaluation period. Because of the low numbers enrolled each month, for the purpose of assessing the effect of the intervention over time, participants were grouped by semester of enrolment/matching. Differences, 95% confidence intervals and p-values are adjusted for baseline characteristics to account for residual imbalances remaining after propensity matching.

The figures show that those receiving Healthways Coaching reported significantly higher rates of utilisation post-enrolment when compared to similar control participants not enrolled in the CDMP. However, those differences were smaller than the ones obtained when comparing the entire CDMP cohort to their matched controls. Sensitivity analyses, where Healthways participants were matched to other CDMP participants, supported this finding by showing reduced excess (compared to the Control cohort) in service utilisation in those receiving Healthways Coaching.

Figure 69 Potentially preventable hospitalisation admissions in the CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N=1,088), and adjusted differences between the two matched cohorts.
Figure 70 Potentially preventable readmissions in CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N= 1088), and adjusted differences between the two matched cohorts

Difference (95% CI): 0.059 (0.021; 0.098)
p-value =0.002

Semester of enrolment
Figure 71 Emergency Department presentations in the CDMP cohort receiving Healthways telephone coaching (maroon), in the matched control (grey) cohort (N= 1168) and adjusted differences between the two matched cohorts.

Difference (95% CI): 0.237 (0.005; 0.468)

p-value = 0.045
Service utilisation at the individual level over time

Matched analyses were used to consider changes in service use after the Healthways intervention, compared to before it. For CDMP and matched Control cohort patients, the monthly rate of service use was calculated for each month. The month of commencement of Healthways/matching was designated as time zero. Each month before and after time zero reflects elapsed time before or after commencement/matching for each patient. The average rates and confidence intervals were calculated for each month to provide the description of longitudinal patterns for each cohort.

**Figure 73, Figure 74, Figure 75 and Figure 76** shows the monthly rate (and confidence limits) for each outcome measure month before and after undertaking the telephone coaching intervention. The figures show that, for all outcomes analysed:

- There was no clear differences in the rate and pattern of service utilisation between the two cohorts – they were virtually identical
- The overall pattern was very similar to that already described for the cohort overall, namely commencement of the intervention around a utilisation peak, which was followed by an immediate sharp decline in service use, and then a more steady decline over time
- Those analyses are unadjusted and do not account for the small imbalances remaining after matching. As opposed to the modelled differences which are adjusted for key baseline characteristics, the longitudinal plots do not adjust for any variables so residual imbalances could remain.
Figure 73 Monthly average of potentially preventable admissions for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 74 Monthly average of potentially preventable readmissions (following any unplanned admission) for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 75 Monthly average of Emergency Department presentations for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 76 Monthly average of potentially preventable bed days for the matched CDMP Healthways cohort (maroon) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point).
**Mortality**

Figure 77 shows that Healthways participants appear to be significantly less likely to die than the control cohort, with an adjusted reduction of 4.7% in the mortality rate. This finding should be treated with caution. The most likely explanation for this finding is that the Healthways cohort available to the Evaluation was primarily a survivor cohort, due to the retrospective consent process. As indicated previously, Healthways participants between July 2012 and July 2013 were retrospectively consented for data linkage in August 2013. The service provider attempted to contact all Healthways participants who participated in the previous year. There were very few refusals, but around one quarter of participants were not able to be contacted. In some instances this may be because patient had died. We are unable to ascertain the true mortality rate of the entire Healthways cohort and think it is likely that our results underestimate the rate of mortality.

**Figure 77 Matched analysis of proportion of death for members of the Healthways (maroon) and Control (grey) cohorts before and after enrolment, and modelled differences between the two cohorts, with time zero indicating time of enrolment in Healthways (number of cohort members across time shown under the X axis)**
3.4.5 The benefit of CDMP participation for Aboriginal people

As already indicated, if a patient was reported as Aboriginal in at least one hospital or admission or emergency department presentation record, (s)he was considered Aboriginal for the purpose of our analyses including adjustment, matching and analyses by Aboriginal subgroups.

In all, 2423 Aboriginal participants were reported in the CDMP Evaluation Cohort. Of these, 1,950 were available for matching, as per the method outlined for the overall cohort. A separate matching process was implemented for Aboriginal patients, limiting candidates for matching to patients from the Control cohort similarly identified as Aboriginal. The resulting matched cohort included 1838 CDMP and 1838 Control cohort members. Of those, 1658 were alive and included in all analyses of service utilisation.

The quality of the matching achieved was again very high. Only small imbalances were identified for some LHDs (SD < 0.23) and by gender (SD=0.11).

Figure 78, Figure 79, Figure 80, Figure 81 and Figure 82 show the annual rates of service utilisation, at the cohort level, in the matched CDMP Aboriginal cohort (N=1838 and in the Control Aboriginal cohort (N=1838). Due to the smaller numbers of participants in these analyses, they were grouped in 6-month epochs (which we have named semesters) according to the month of enrolment/matching. Average annual rates of service utilisation were calculated between the end of the month of enrolment and the end of the evaluation period (November 2013).

Taken together the figures show that:

- The CDMP Aboriginal cohort shows a consistent excess in yearly rate of potentially preventable admissions, potentially preventable readmissions and potentially preventable bed days, compared to the Control Aboriginal cohort (p < .001)
The pattern for these outcomes also appears to be similar for both cohorts: the rate of potentially preventable admissions, readmissions and potentially preventable bed days appears to increase gradually in those enrolled/matched more recently.

There were no differences between the cohorts in yearly rate of emergency department presentations (p = 0.117), and for both cohorts the rate appeared to remain flat over time.

Figure 78 Potentially preventable admissions in the matched CDMP Aboriginal cohort (orange) and Control Aboriginal cohort (grey) cohort (N= 1838) by semester of enrolment
Figure 79 Potentially preventable readmissions for matched CDMP Aboriginal cohort (orange) and Control cohort (grey) cohort (N= 1838) by semester of enrolment
Figure 80 Potentially preventable bed-days for matched CDMP Aboriginal cohort (orange) and Control cohort (grey) cohort (N=1838) by semester of enrolment
Figure 81 Emergency Department presentations for matched CDMP Aboriginal cohort (orange) and Control cohort (grey) cohort (N= 1838), by semester of enrolment
Figure 82 a) b) c) d) Modelled differences in potentially preventable admissions, potentially preventable re-admissions, Emergency Department presentations, and potentially preventable bed-days between the matched CDMP Aboriginal and Control Aboriginal cohorts.

- Potentially preventable admissions
  
  Difference (95% CI): 0.450 (0.307; 0.593)
  p-value < 0.001

- Potentially preventable readmissions
  
  Difference (95% CI): 0.102 (0.038; 0.165)
  p-value = 0.002

- ED presentations

- Potentially preventable bed days
Service utilisation at the individual level over time

Matched analyses were used to consider changes in service use after enrolment in the CDMP, compared to before enrolment. For surviving CDMP Aboriginal and matched Control Aboriginal cohort patients, the monthly rate of service use was calculated for each month. The month of enrolment/ matching was designated as time zero. Each month before and after time zero reflects elapsed time before or after enrolment/ matching for each patient, with average rates and confidence intervals calculated for each month to provide the description of longitudinal patterns for each cohort.

**Figure 83, Figure 84, Figure 85 and Figure 86** shows the monthly rate (and confidence limits) of each of the main Evaluation outcome measures (potentially preventable admissions, potentially preventable readmissions, potentially preventable bed days and emergency presentations) for each month before and after enrolment. Plots were truncated at -78 and 30 months to exclude periods with negligible numbers of participants (and thus very wide confidence intervals). The most striking feature of the figures is that they show the same overall pattern over time as that of the CDMP and Control cohorts overall, and the pattern is virtually identical for both cohorts. The figures show that:

- The monthly rate of potentially preventable admissions, readmissions and potentially preventable bed days for both the CDMP Aboriginal Cohort and the Control Aboriginal cohort was similar: utilisation increased steadily in the years prior to enrolment, until the year before enrolment, when the monthly rate of admissions increased sharply.
- Enrolment occurred at the peak of utilisation in the pre-enrolment period for which data were available (4 to 7 years before enrolment).
- Admissions declined sharply immediately following enrolment for both cohorts, and then gradually over the post enrolment period.
- Post enrolment, the rate of potentially preventable admissions, readmissions and potentially preventable bed days remained consistently higher in the CDMP Aboriginal cohort compared to the Control cohort.
Emergency Department presentations showed the same overall pattern over time as other outcome measures for both cohorts; however the rate of Emergency Department presentations was virtually identical for both cohorts throughout.

Figure 83 Monthly average of potentially preventable admissions for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 84 Monthly average of potentially preventable re-admissions for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point)
Figure 85 Monthly average of potentially preventable bed-days for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/matching (numbers below the X axis indicate patient numbers in each cohort at each time point).
Figure 86 Monthly average of Emergency Department presentations for the matched CDMP Aboriginal cohort (orange) and Control (grey) cohorts before and after commencement/ matching (numbers below the X axis indicate patient numbers in each cohort at each time point)

Mortality

Differences in mortality between the matched Aboriginal CDMP and Control Aboriginal cohorts were examined at a cohort level, and longitudinally.

As Figure 87 shows, mortality increased over time post enrolment for both cohorts. There were no significant differences between the two cohorts ($P=0.203$). After 24 months post enrolment, volatility is evident in the data, reflecting smaller numbers of patients with longer duration enrolment, rather than any real change in trend.
Figure 87 Proportion of death pre and post enrolment in the matched Aboriginal CDMP (orange) and control Aboriginal (grey) cohorts with time zero indicating time of enrolment (numbers below the X axis indicate patient numbers in each cohort at each time point). Matched analysis of proportion of death for members of the Healthways.
3.4.6  LHD–specific outcomes

Sub-analyses of outcomes for each LHD were undertaken, replicating the analyses undertaken for the overall cohort. The approach was identical to that for the other sub-group analyses.

First, CDMP participants were matched to control cases, using the methods outlined for the overall cohort. However, as for the other sub-groups, a separate matching process was implemented for the LHD-specific analyses, limiting candidates for matching to patients from the Control cohort in the same LHD as the CDMP patient.

Second, rates of service utilisation were analysed at the cohort level, in the LHD CDMP cohort and in the matched LHD Control cohort. As for the other sub-groups, due to the smaller numbers of patients in these analyses, participants were grouped in 6-month epochs (which we have named semesters) instead of by month of enrolment/matching. Average annual rates of service utilisation were calculated between the end of the month of enrolment and the end of the evaluation period (November 2013).

Matched analyses were also used to consider changes in service use after enrolment in the CDMP, compared to before enrolment. For surviving LHD CDMP and matched LHD Control patients, the monthly rate of service use was calculated for each month. The month of enrolment/matching was designated as time zero. Each month before and after time zero reflects elapsed time before or after enrolment/matching for each patient, with average rates and confidence intervals calculated for each month to provide the description of longitudinal patterns for each cohort.

Overall, the vast majority of the findings at the LHD level parallel those already reported for the entire cohort. Specifically, the overwhelming finding was enrolment of patients at the peak of utilisation of the evaluation period. The pattern of utilisation was then identical for the CDMP patients and the control patients, namely a sharp decline in both cohorts immediately following enrolment.

At the cohort level, most LHDs also showed a similar pattern to the overall cohort, specifically a consistent excess in yearly rate of potentially preventable admissions, potentially preventable readmissions and potentially preventable bed days, compared to the LHD Control cohort. For a small number of LHDs the excess was not consistently present, with the CDMP and Control cohorts not significantly differing in their level of service utilization on all or most outcomes (specifically the following LHDs: South Western, Northern, Murrumbidgee). For an even smaller minority of LHDs, one outcome presented as an outlier, such that the LHD CDMP participants were heavier users of most services than LHD Control patients, but did not differ significantly on a single outcome measure (specifically: potentially preventable readmissions of CDMP patients in Mid North Coast, Nepean and Southern did not differ from the control cohorts).

The full details of these analyses are presented in Appendix 5.9.

3.4.7  Predictors of outcome for CDMP Participants

To consider whether particular patients might have benefitted more or less from enrolment in the CDMP, a range of key variables that might identify sub-groups of CDMP participants was further examined. The variables included in this analysis included socio-demographic characteristics (age, sex, Aboriginality, SEIFA) geographic location (ARIA), Area Health Service (recognizing that much of the foundation of the Program reflected the AHSs that preceded the split into LHDs), acute service utilisation in the year preceding enrolment (number of hospitalisations - overall, unplanned and potentially preventable, number of Emergency Department presentations and target condition.

To explore the impact of these characteristics of patients on outcome, interactions between each variable and the effect of the Program was assessed, in terms of impact on the yearly rate of potentially preventable hospitalisations post-enrolment.
Full details of the analysis can be found in Appendix 5.10.

Table 24 below shows interactions between the variables and the program outcome as defined, where some indication of statistical relationship was identified. Only two appear to have a strong effect (with a p-value smaller than 0.001): previous number of Emergency Department presentations and whether the patient had Coronary Artery Disease (CAD).

As the number of pre-enrolment Emergency Department presentations increases, the rate of future (i.e. post-enrolment) potentially preventable admissions increases in both groups. However, the effect of previous presentations on the effect of CDMP follows a slight J shape with an absolute excess of the outcome (potentially preventable admissions post enrolment) going from 0.29, 0.19, 0.41, 0.38 for 0 previous Emergency Department presentations, 1 Emergency Department presentations, 2 Emergency Department presentations and 3 or more Emergency Department presentations respectively.

For CAD, the excess of post-enrolment potentially preventable hospitalisations seen for CDMP participants compared to control patients is larger for those without CAD (0.41), than with CAD (0.17). CAD may therefore be a condition more amenable to management via this hospital avoidance program.

A few other of the variables tested had an interaction with CDMP outcome, but at borderline significance levels (0.01 < p-value < 0.05) so that they should be considered indicative at best. These included:

- Area Health Service (extent of excess f potentially preventable hospitalisation post enrolment varies by AHS)
- ARIA (extent of excess of potentially preventable hospitalisation post enrolment varies by geographic location)
- COPD (excess of post-enrolment potentially preventable hospitalisations seen for CDMP participants is larger for those with COPD, than without COPD) and
- Hypertension (excess of post-enrolment potentially preventable hospitalisations seen for CDMP participants is larger for those without Hypertension, than with Hypertension).

Overall, the key finding from this analysis is that the impact of CDMP is very consistent across subgroups. Virtually every subgroup shows a significant excess of potentially preventable admissions in the CDMP cohort compared to the control cohort. Only one subgroup shows a negative difference (those with hypertension) but it is not statistically significant.

Table 24 Potential predictors of CDMP outcome: Interaction between key variables, and the difference between CDMP and control cohorts

<table>
<thead>
<tr>
<th>Variable/Category</th>
<th>CDMP Mean (95% CI)</th>
<th>Control Mean (95% CI)</th>
<th>Difference Mean (95% CI)</th>
<th>Interaction p-value</th>
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<tbody>
<tr>
<td>AHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Southern AHS</td>
<td>0.96 (0.75; 1.17)</td>
<td>0.75 (0.63; 0.87)</td>
<td>0.21 (-0.03; 0.45)</td>
<td>0.0354</td>
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<td>Greater Western AHS</td>
<td>0.94 (0.81; 1.08)</td>
<td>0.79 (0.58; 1.00)</td>
<td>0.15 (-0.09; 0.40)</td>
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<tr>
<td>Hunter New England AHS</td>
<td>1.16 (1.06; 1.26)</td>
<td>0.73 (0.64; 0.83)</td>
<td>0.43 (0.30; 0.56)</td>
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<tr>
<td>North Coast AHS</td>
<td>1.11 (0.98; 1.23)</td>
<td>0.76 (0.66; 0.86)</td>
<td>0.35 (0.19; 0.51)</td>
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<td>Northern Sydney Central Coast</td>
<td>0.97 (0.90; 1.05)</td>
<td>0.62 (0.52; 0.72)</td>
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<td>South Eastern Sydney Illawarra</td>
<td>0.89 (0.85; 0.94)</td>
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<td>0.30 (0.23; 0.37)</td>
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<td>Sydney South West AHS</td>
<td>1.17 (1.02; 1.33)</td>
<td>1.06 (0.93; 1.19)</td>
<td>0.11 (-0.09; 0.31)</td>
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<td>Sydney West AHS</td>
<td>1.40 (1.19; 1.61)</td>
<td>0.80 (0.73; 0.87)</td>
<td>0.60 (0.38; 0.82)</td>
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<td>Age</td>
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<td>0.64 (0.36; 0.91)</td>
<td>0.25 (-0.12; 0.62)</td>
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<td>Less than 50</td>
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<td>0.53 (0.46; 0.59)</td>
<td>0.16 (0.06; 0.26)</td>
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<td>0.88 (0.79; 0.97)</td>
<td>0.61 (0.52; 0.69)</td>
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<td>0.65 (0.59; 0.70)</td>
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<td>70 to 74</td>
<td>1.09 (1.01; 1.17)</td>
<td>0.73 (0.63; 0.84)</td>
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<td>0.85 (0.76; 0.94)</td>
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<td>80 to 84</td>
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<td>0.74 (0.66; 0.83)</td>
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<td>85 and more</td>
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<td>0.76 (0.66; 0.86)</td>
<td>0.30 (0.17; 0.42)</td>
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<td>ARIA</td>
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<td>0.31 (0.26; 0.35)</td>
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<td>Inner Regional Australia</td>
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<td>Major Cities of Australia</td>
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<td>0.65 (0.59; 0.70)</td>
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<td>0.73 (0.63; 0.84)</td>
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<td>0.76 (0.66; 0.86)</td>
<td>0.30 (0.17; 0.42)</td>
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<td># ED presentations in preceding year</td>
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<td>0.43 (0.36; 0.49)</td>
<td>0.29 (0.19; 0.39)</td>
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<td>0</td>
<td>0.64 (0.60; 0.68)</td>
<td>0.46 (0.41; 0.50)</td>
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<td>1</td>
<td>1.03 (0.96; 1.11)</td>
<td>0.62 (0.56; 0.68)</td>
<td>0.41 (0.32; 0.51)</td>
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<td>2 or more</td>
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<td>1.16 (1.09; 1.24)</td>
<td>0.38 (0.25; 0.51)</td>
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<td>0.59 (0.36; 0.82)</td>
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<td>0.75 (0.72; 0.79)</td>
<td>0.41 (0.35; 0.48)</td>
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<td>Yes</td>
<td>0.70 (0.66; 0.75)</td>
<td>0.54 (0.48; 0.60)</td>
<td>0.17 (0.09; 0.24)</td>
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<td>No</td>
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<td>0.17 (0.09; 0.24)</td>
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<td>0.70 (0.67; 0.74)</td>
<td>0.36 (0.30; 0.41)</td>
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4 Discussion

The need for the integration of care for people with severe chronic disease and the concept of a model of coordinated, joined-up and shared care is well-recognised; it was highlighted in the Garling, National Health and Hospitals Reform Commission and National Primary Health Care Strategy reports. Accordingly the NSW Ministry of Health has encouraged efforts to deliver more care in community settings, with the joint aims of avoiding potentially preventable admissions to hospital and reducing net costs. Interventions that prevent such admissions can, in theory, both improve the quality of care delivered and help address the financial challenges currently faced by the Ministry of Health alongside health departments nationally and internationally. As a result, the NSW Chronic Disease Management Program was established. The CDMP predominantly targeted people who require disease management and tertiary prevention as well as those who require continuing and supportive care. The Program was expected to include a wide range of initiatives to support self-management, alongside care co-ordination for people requiring more intensive support. There is a strong evidence base supporting the notion that self-management is worthwhile, and, in particular, that proactive, behaviourally focused self-management support designed to increase self-efficacy can have a positive impact on people’s clinical symptoms, attitudes and behaviours, quality of life and patterns of healthcare resource use.

The primary purpose of the Evaluation of the CDMP was to develop the evidence base for policy makers in the NSW Ministry of Health, to support future policy decisions about effective options for chronic disease management in NSW. The Evaluation focused on two primary areas of investigation. First, the process evaluation was designed to investigate the nature of the models implemented across the State, and the extent to which the approaches were able to achieve delivery of care to patients with chronic disease. Such care necessarily involves a range of players including primary care, specialist medical, acute hospital and community services – and transitions between services and providers. A key feature of the Program was its focus on building care provider relationships, across the spectrum of care provision. Accordingly, an important issue for the Evaluation is to consider the evolution of these relationships.

The second main area of focus for the Evaluation was the impact of the Program on utilisation of acute care. It was specifically designed to examine the experiences of those individuals who were registered as participating in the Program, rather than examining aggregated effects on the patient population at the LHD or State level. The use of individual-level data, rather than aggregated data, is a significant feature of the Evaluation. The other significant feature is that it used control cohorts to take account of the well documented natural drop in service use that occurs when high-risk cases are selected for an intervention.

This report is the final output of the Evaluation of the CDMP, and here we detail the key findings and their implications.

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4.1 Overview of key findings

4.1.1 Significant evolution of program approaches was evident at local levels.

It has been noted that the scale and complexity of delivering such care activities can easily overwhelm even the strongest program settings, let alone an emergent ones. The CDMP began with challenging enrolment targets, and with little time for developing the program infrastructure, at local or at state level.

Over time, the Program developed in a number of directions:

- The eligibility criteria were revised and relaxed, to ensure that there were enough people to enrol, and that those who were enrolled were people who would be likely to benefit from care coordination and telephone support.
- LHDs developed ways of implementing the core elements of the Program – care coordination and telephone support – that suited their local circumstances. These varied, and as a result the key program elements: comprehensive assessment, shared care planning and care coordination – took different forms in different places.
- LHDs identified ways of linking the CDMP with existing services and programs within their LHDs, at a governance and operational level. This was an ongoing process which in some cases led to quite tight integration, and in others left the CDMP as a relatively stand-alone program.
- Both LHDs and NSW Health had to develop the ICT systems and other infrastructure to support the Program. This included databases for people in the Program, systems for confidential exchange of clinical information and single points of contact for enrolment and referral. In many cases these were developments of the existing LHD infrastructure rather than entirely new undertakings.
- LHDs moved some way towards making the CDMP part of a system of care, with clear entry points, a range of options for care, ongoing assessment of people in the Program and processes for escalation or re-entry for those no longer receiving active support. However in most cases this was still in progress.

A number of factors helped or hindered this process of development, including:

- Previous relationships between the organisations involved, especially the LHD and the ML and local Aboriginal health services
- Characteristics of the LHD area and existing services. These determined to a significant extent both the opportunities and the challenges for the CDMP
- The balance between direction from NSW Health and local discretion on how the Program should be implemented to stay within the parameters of the Program while meeting local circumstances; and flexibility at both state and local levels in modifying expectations as the Program evolved;
- The level at which the Program was sponsored within the LHDs and the presence of strong champions;
- The readiness of existing services to engage with the Program, within the LHD and beyond;
- How adequate information and other systems were for supporting a program of this size and complexity.

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The program configurations that emerged showed how the program was tailored to local circumstances. Not surprisingly, urban and rural/remote programs evolved differently, reflecting the difference between relatively compact, complex and service rich urban environments and more dispersed rural areas that are often less well served. The location of care coordinators was a foundational decision for the Program. Having care coordinators in both LHD and ML provided the basis for a bridge, however slender, between the organisations which supported a stronger primary care orientation. A particularly striking finding was that programs that were more systematic and more integrated within the LHD were likely to source their people from LHD hospitals rather than elsewhere in the LHD. One interpretation of this is that the systematic approach facilitated the existing dominance of hospitals and had the effect of ‘crowding out’ other services which might have equally relevant candidates for care coordination.

The findings of the process evaluation raise questions of where the CDMP lies (and future programs should lie) on a continuum between a discrete service ‘supplement’ for people attending hospitals who need extra support for a limited time, and a whole of system approach to improving care for people with chronic disease. This question can be put in a number of ways:

- How much is this a matter of providing a new set of discrete services and processes of care (care coordination and telephone support), and how much of integrating (and also supplementing) existing services (e.g. diabetes education) and processes (existing care planning)? While existing services may sometimes be inadequate, the danger of adding yet another program is that it adds to the complexity of the system, and could reduce rather than enhance integration.
- Who is the Program for? Is it for a set of enrolled individuals, or is it for all clients of the LHD who need better chronic disease care? Or, since these people come from primary care where their need for better care coordination might be identified in a more timely way, should it also be for clients of primary care, and so by implication all citizens of NSW, whether current clients of NSW Health or not. Broadening the Program allows the possibility of more timely intervention, but of course also increases the task of identifying appropriate people, and a greater challenge of reaching those who could benefit.
- Whose health service and clinical problems should the Program address? The CDMP was originally designed to reduce levels of hospitalisation, and so solve a problem for NSW Health. However this problem can only be solved with the collaboration of primary care, which is unlikely to participate enthusiastically unless the Program also meets their needs for better support in chronic disease care - for example by responding to all referrals from GP, whether they meet hospitalisation criteria or not.
- Should the Program provide a time limited intervention that finishes when the current health crisis ends or, since most of those enrolled had complex care needs, should it retain contact, either through low level support or a system of easy re-entry into enhanced care whenever needed?

4.1.2 Enrolment to the Program and its interventions predominantly occurred at times of peak acute service utilisation

A strikingly consistent feature of the Evaluation findings was that, for most outcomes, enrolment in the Program occurred at around a time peak in service utilisation. This suggests that the selection of patients for the Program was linked with their use of acute services. This implication presents something of a challenge for the Program model: a fundamental premise of chronic care is the proactive management of future health crisis risk; the Program model - as has been operationalised - manages health crisis risk reactively.

The intention of the Program was to avert risk of unnecessary acute service use. Despite varied local approaches across LHDs a number of aims were shared: identifying and supporting those with greatest needs; providing more preventive care; and reducing the amount of care provided unnecessarily in hospital settings. The finding of a relationship between peak acute service utilisation and enrolment reflects an important possible disconnect between the Program’s ambitions and effective risk identification and mitigation. The findings of the Evaluation suggest that the CDMP was more likely to identify – and respond to - realised risk (current high levels of service utilisation) rather than potential risk (predicted future high levels of service utilisation).
The finding is by no means unique to the CDMP. A similar phenomenon has been reported by other comparable programs, which have targeted similar public health landscapes. As a case in point, the aim of the recent Partnership for Older People Projects (POPP) initiative in the UK was to: "shift resources and culture away from institutional and hospital-based crisis care for older people towards earlier, targeted interventions within their own homes and communities". The predominant pattern of findings reported for the POPP was also a peak in unplanned service utilisation around the start time of the intervention. The authors similarly hypothesized that the finding is likely a sign that the selection of patients for the intervention was linked with their use of hospitals.

4.1.3 Participation in the CDMP was associated with increased unplanned and decreased planned acute service use

Perhaps the central unifying aim of the CDMP was to reduce potentially preventable hospital utilisation. We found no evidence of a general reduction in potentially preventable admissions. We found an unexpected increase in unplanned admissions, potentially preventable admissions and emergency department presentations for patients enrolled in CDMP compared to the control cohort.

One possible explanation for the findings is that the process of ‘case finding’ identified unmet need. Although it is likely that some of the apparent increase may have been due to incomplete matching of cases and controls, it is more likely that greater attention to at-risk patients may at times identify more patients judged to need admission to hospital. It is possible that when patients first entered into the Program service providers may have identified problems that necessitated hospital admission. The data do not allow determination of whether any additional admissions were appropriate or not.

At the same time, there was no increase in overall service use, that is all hospital episodes, compared to the Control cohort. This suggests that there were reductions in planned admissions compared to the control cohort. The reasons for the observed reduction in planned admissions are not clear. It has been suggested that this may have been due to moving services into primary care settings, an aim of the CDMP.

The altered pattern of service use was also a key finding of the recent evaluation of the UK Integrated Care Pilots, which the authors report as the most counter-intuitive finding in the evaluation. Implementing case management for at-risk patients was associated with a reduction in outpatient attendances and planned admissions, but an increase in unplanned admissions. This is almost the reverse of what might have been expected given the intended aims of many of the pilots to reduce unplanned admissions. This effect was most marked in sites focusing on case management of patients at risk of unplanned admission.


4.1.4 There was a dramatic decrease immediately following enrollment in both CDMP and Control patients

It has been repeatedly noted that there is a natural tendency for high risk patients to show reductions in use in the absence of any intervention, a statistical phenomenon called ‘regression to the mean’. This effect is illustrated in Figure 88, which is based on the Hospital Episode Statistics for England. The figure is based on a ten-year period and illustrates hospital admissions for a cohort of frequent hospital users identified in the central intense year. Hospital admissions were tracked for this cohort of people for five years beforehand and five years afterwards. The figure illustrates that, if patients are chosen for an intervention based on their current high rates of hospital admissions, we would expect their rates of hospital admissions to reduce over time, even in the absence of a specific intervention.

Figure 88 Regression to the mean in the absence of intervention, reproduced from Steventon et al.\textsuperscript{101}

![Figure 2.1: Regression to the mean in the absence of intervention](image)

Source: Department of Health for England analysis of Hospital Episode Statistics

Both the CDMP and the POPP in the UK enrolled people at the peak of their acute utilisation. When compared to matched control patients, both evaluations found that unplanned hospital use did not improve in the intervention cohort compared to the control cohort, and showed ‘regression to the mean’ effects.

This finding raises two points. The first and most obvious is that an evaluation without an appropriate control cohort would tend to overestimate the effectiveness of the intervention on hospital use, since some or all of the observed reductions would have happened anyway. The second and equally important issue is the

appropriate outcome measure for programs like the CDMP. On the one hand, there is evidence of limited scope to prevent hospital admissions in the short term for people who have not recently had a hospital admission. For example, in the UK analysis, fewer than five per cent of 65-year-olds who have not had a hospital admission in the last two years will have an admission in the next 12 months. By focusing on people with a history of hospital admissions, the programs here and elsewhere have concentrated on those patients more likely to demonstrably benefit from the intervention in the short term. Yet, regression to the mean poses a significant challenge to disentangling real impact from natural change when the outcome of interest is at the extreme end of the spectrum, due to regression to the mean. As a sole outcome suite, acute service use may not be an adequate measurement strategy. Additional data, for example quantification of the impact of programs on the number of GP visits and the intensity of social care use, could provide better explanatory value.

4.1.5 The overall pattern of service use outcomes did not differ by LHD

As discussed above, the process evaluation identified significant differences, on a range of dimensions, between LHD approaches to the CDMP. Despite this, the service patterns of service utilisation in most cases essentially mirrored those found for the Program overall. Specifically, the overwhelming finding was enrolment of patients around a peak of utilisation in the evaluation period. The pattern of utilisation was then identical for the CDMP patients and the control patients, namely a sharp decline in both cohorts immediately following enrolment.

A number of interpretations may - either separately or together – account for this finding. As a starting point, the LHDs are not unitary phenomena, so that model features, service availability and patient need in any particular part of the LHD may not be replicated across the entire service in the geographic catchment. Analysis at the LHD level is necessarily an aggregated and possibly insensitive approach. Using matched controls from within the LHD to some extent accounts for this possibility.

Another interpretation is that the Program had not reached maturity in any LHD, or maturation was stymied in terms of further evolution. While significant evolution was evident, the majority of LHDs had not fully realised the potential of dedicating resources to pre-emptive risk management. To some extent this may reflect the time available for a significant paradigm shift – reaching beyond the acute sector to influence acute sector outcomes. Alternatively, and/or additionally, progress may have been undermined from reaching scale due to LHD needs for a range of systemic and systematic support for local development. This point is taken up further below, in consideration of implications of the findings of the Evaluation for future efforts.

4.1.6 Aboriginal participants in the CDMP were mainly identified through the acute sector at times of peak service utilisation, with an excess of post-enrolment utilisation compared to the control cohort.

Identification, referral and delivery of CDMP for Aboriginal participants occurred mostly through the acute sector

Most Aboriginal program participants were identified and referred into the CDMP via LHD services - primarily LHD hospitals (through the 48 Hour Follow-Up Program), and to lesser extent through rehabilitation services and other LHD services. LHD Care Coordinators and 48 Hour Follow Up staff were identified as key to the process of identification and referral of Aboriginal people to the Program. Referrals from GP into the Program

were not high, and this was also true of referrals of Aboriginal patients into the Program by ACCHSs. At the same time, the final scan in 2014 of all LHDs found that LHDs estimated that fewer than 25% of eligible Aboriginal patients were being identified and enrolled through the 48 Hour Follow Up Program.

ACCHSs appear to have limited visibility in the delivery to care to Aboriginal clients on the CDMP. And while LHD-based care coordinators and ML-based care coordinators reported liaising with ACCHSs, in general ML-based care coordinators reported spending a lower proportion of time liaising with ACCHS than their LHD-based counterparts.

On the other hand, Medicare Locals were reported to play an increasingly important role in the CDMP. Most MLs indicated that they had specific arrangements for supporting referrals for Aboriginal people into the CDMP, primarily by having links with other Aboriginal health programs such as the CCSS Program, Closing the Gap, and with the 48 Hour Follow Up Program.

Integration with other programs, services and sectors improved over time, but remained variable

The process evaluation revealed that there was significant evolution in the focus on integration of CDMP with other relevant programs, services and the like. The final LHD scan survey in 2014 indicated that 11 LHDs had Aboriginal health represented on their governance structure and 5 had ACCHS representation on their governance structure.

However, integration occurred most commonly with the 48 Hour Follow Up Program, with almost two thirds of LHDs reporting some degree of integration. Integration with other services and sectors providing Aboriginal specific chronic disease care was varied in degree of clarity, formality and development.

Service utilisation outcomes of Aboriginal participants largely mirrored those for the entire CDMP cohort, with a consistent excess in rates of potentially preventable admissions post enrolment compared to the control cohort.

The CDMP Aboriginal cohort showed a consistent excess in yearly rate of potentially preventable admissions, potentially preventable readmissions and potentially preventable bed days but not emergency department presentations. As for the overall cohort, enrolment occurred at the peak of utilisation in the pre-enrolment period for both the Aboriginal CDMP cohort and the Aboriginal Control cohort, declining sharply for both cohorts immediately after enrolment but remaining consistently higher in the CDMP cohort.

The only point of departure from the overall findings of the Evaluation concerned Emergency Department presentations. These events showed the same overall pattern over time as other outcome measures for both cohorts; however the rate of Emergency Department presentations was virtually identical for both cohorts throughout.

The higher rate of Emergency Department attendances by Aboriginal people overall, when compared to non-Aboriginal people, is well-documented and was confirmed in the present data. Lack of comprehensive diagnostic data for Emergency Department presentations prevents further exploration of the drivers of Emergency Department presentations which may be common to both control and CDMP participants, resulting in the two groups having a similar pattern and rate.

The prominence of the 48 Hour Follow-Up Program in CDMP may have been something of a double-edged sword. On the one hand, it attests to the utility of building on existing systems. On the other hand, identification of participants via the acute sector brought with it the previously discussed risks to measurable benefits in the Evaluation.

4.1.7 External telephone coaching did not appear to improve the outcomes of interest in the Evaluation

An opportunistic sample of CDMP participants receiving external telephone coaching from Healthways was available to the Evaluation. As indicated in the Results section of this report, the findings regarding the
Healthways Evaluation cohort should be treated with some caution, due to potential bias in obtaining the sample.

Irrespective of CDMP enrolment date, those enrolled in the Healthways intervention between July 2012 and December 2013 formed the telephone coaching Evaluation cohort. Not all participants were available due to two different methods of accessing records. For those enrolled before July 2013 a retrospective consent process was instituted, yielding a sample of participants over the period. The rate of refusal to consent was relatively low, but approximately one quarter of participants were un-contactable, and no information available about the non-consented Healthways participants. For those enrolled after July 2013, all participants were available. It is possible that the observed rates of service utilisation and mortality may have been different with the entire cohort of participants represented.

The Healthways Coaching Evaluation cohort appeared to show significantly higher rates of utilisation post-enrolment when compared to similar control participants not enrolled in the CDMP. However, those differences were smaller than the ones obtained when comparing the entire CDMP cohort to their matched controls. Sensitivity analyses, where Healthways participants were matched to other CDMP participants, supported this finding by showing reduced excess (compared to the Control cohort) in service utilisation in those receiving Healthways Coaching.

Longitudinally, there appeared to be no clear differences in the rate and pattern of service utilisation between the two cohorts. The overall pattern for the Healthways cohort and the Control cohort over time appeared to be very similar to that already described for the cohort overall, namely commencement of the intervention around a utilisation peak, which was followed by an immediate sharp decline in service use, and then a more steady decline over time.

While caution should be exercised in the interpretation of the results for the Healthways Evaluation cohort, it is noteworthy that the findings confirm those of a recent rapid review. It concluded that telephone coaching for people with chronic conditions can improve health behaviour, self-efficacy and health status; however, the evidence for improvements in health service use was considered limited.

4.2 Limitations

Considering the impact on Program outcome against the background of changing environment and adaptive implementation

There is a challenge involved in making judgements about heterogeneous and emergent activities in a changing environment. Not only did the LHDs and their programs themselves adapt and change but the changing wider context, including state and national reforms, introduced a range of confounding factors. Moreover, the LHDs built on existing practices, then learned, adapted and abandoned some things and seized new opportunities. Any before-and-after evaluation is limited by the emergent and changing character of the interventions.

We have looked at cohort differences over time, either by monthly cohorts where number permitted, or by semester cohorts where we had smaller numbers. This allowed us to broadly consider changes in the impact of program participation relatively early or relatively late in the Program. The results suggest that the overall impact of the Program on all outcomes was a consistent excess in service utilisation among the CDMP cohort.

Obtaining an appropriate control cohort

The major potential methodological limitation of the Evaluation was the absence of a control cohort, since the Program was not implemented as a randomised control design. To overcome this limitation, a control cohort was constructed by matching CDMP participants to similar patients in the NSW Admitted Patient Data Collection (APDC). The process for obtaining the control cohort was matching using propensity scoring methods, along best practice in statistical methods. Essentially, this method simulates a randomised control trial, and is common practice in clinical observations studies where true random assignment is often not possible. The approach represents a significant strength of the Evaluation.

Notwithstanding the strength of the approach, the validity of a constructed control cohort such as ours must always be considered because the matching process was constrained by the information we had available in the APDC. It is possible that the CDMP cohort and the constructed Control cohort differed systematically from each other on some other unknown characteristic or variable. We conducted extensive diagnostic testing of the quality of the matching and are confident about our matching in the majority of cases.

Selection bias for the statistical analysis

The statistical analysis necessarily concentrated on CDMP participants who were potentially able to be matched to a control case and able to experience service events post enrolment, namely survivors. This resulted in much of the analysis focusing on a majority but not all CDMP participants. The patterns in the overall cohorts were examined before and after matching, and removing survivors. Inspection of these patterns instills confidence that the exclusion of cases did not systematically bias the outcomes of the analysis.

Moreover, follow-up analysis of the monthly rate of potentially preventable hospitalisation of matched and unmatched CDMP participants indicated that the overall pattern was similar – that is enrolment at around peak utilisation followed by a sharp decline in potentially preventable hospitalisation, leveling off over time at a higher level than prior to enrolment (Figure 89). The data do, however, suggest an interesting observed difference between these two groups. That is, CDMP participants who were not able to be matched to a control case based on our criteria had consistently lower service utilization over time, except at the point of enrolment. The peak at around enrolment appears to be at a similar level, but rising much more sharply from apparently flatter pre-enrolment levels.

These findings suggest several implications. First, and foremost, they confirm that the matching process is not likely to have systematically changed the outcomes of the analysis or the conclusions of the evaluation.

Secondly these findings suggest that enrolment was associated with particular levels of utilisation, possibly reflecting particular levels of realized risk. Even where patients had apparently lower and more stable utilisation patterns (the unmatched CDMP participants), enrolment was triggered when potentially preventable admissions more suddenly rose above an average of once per month.

Beyond these interpretations the findings in Figure 89 suggest that there may be sub-groups of participants within the CDMP participants, those with rapid and those with less rapid deterioration in terms of service utilisation.
Results are mixed, and it is not clear why

The results presented here suggest that there have been some successes in terms of process aims but more mixed results in terms of outcomes (especially from the patient service utilisation point of view). There are at least three explanations for this (and these may not be mutually exclusive):

- Not enough time has passed to allow process improvements to lead to outcome improvements;
- The causality between process and outcome may be not be well measured by the outcome measures available; and
- The way in which the process objectives have been pursued has led to some outcomes being achieved at the expense of others.

At this point there is no clear way to distinguish the role of the range of possibilities that may have driven the various results. Longer-term, different and more granular analyses are planned by the ACI, which may ultimately tease out more specific and longer term effects.

4.3 Implications of the findings for current policy environment

There is strong commitment in the NSW policy arena to building on the lessons of the CDMP. As a strategic imperative, “NSW is investing in approaches to integrate care and progress towards a health system that routinely provides seamless, effective and efficient care, that responds to all of a person’s health needs across physical and mental health, with connected service provision across different healthcare providers and greater emphasis on community-based services.” A significant focus of the investment in Integrated Care is to better
support people with long term conditions and complex health needs, and be more sustainable in the long run.\textsuperscript{104}

It was an explicit ambition of the Evaluation to provide lessons to take forward in future endeavours. Several broad suggestions for future strategic directions can be distilled from the Evaluation.

**The value of commitment to robust monitoring and evaluation**

A clear legacy of the Evaluation relates to the criticality of appropriately assessing the measureable benefit of investment in service innovation over and above usual care. Focusing on areas of need in public health systems very often equates with focusing on high-risk patients, a focus bringing with it a host of measurement related challenges. While this may seem obvious, the principle can come up against resistance at the front line of care provision because of staff perceptions. CDMP staff who had direct patient contact thought that care for their patients had improved, as did staff in the UK evaluations already described here. A key strength of this Evaluation is that we were able to take account of the natural drop in admissions that occurs when high-risk cases are selected for an intervention. Measurement of what happens in the absence of the intervention/innovation is often difficult and imperfect, but cannot be considered optional.

Beyond the imperative to evaluate, several lessons about what and how to measure also can be distilled. A shortcoming of the Evaluation was its lack of timeliness. Quantitative data and analysis became available after several years of program operation. Similarly, by the time the rounds of process evaluation became available, the programs had already adapted/evolved without the benefit of more complete data.

The issue of timeliness to some extent reflects a widely held view of how best to evaluate interventions where much of the knowledge about the processes and impacts is held locally by those most involved in delivering the change. The Evaluation needs to be embedded in the innovation, to become an active ingredient in the cycle of continuous improvement. The impact of hospital-avoidance interventions should be monitored in as close to real-time as possible. If they are not effective, it might be possible to refine their intervention or connected services in order to improve effectiveness.

The balance of resources in the Evaluation between collecting views of participants, views of processes and collecting quantitative data was skewed somewhat towards the quantitative aspects in this evaluation. The mix was broadly right, in our view; however, it left some elements of the ‘black box’ of local processes/activities/approaches hard to fathom at an operational level. It may be that new data collections, now becoming available through the implementation of Activity Based Funding, might enable more granular process analysis at scale.

Routine data collections will however never fully articulate some critical nuances of drivers of success in local innovation. Ethnographic and observational data focused on elements such as leadership, how professionals and service users interact, and how work is re-organised in reality as opposed to on paper all have the potential to offer valuable insight with more intense data collection, and beneficial to unpacking the ‘black box’.

**Lessons for evaluations for future programs**

It was an explicit ambition of the Evaluation to provide lessons to take forward in future endeavours. Several broad suggestions for future strategic directions can be distilled from the Evaluation. Beyond the imperative to evaluate, several lessons about what and how to measure also can be distilled:

\begin{itemize}
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A multi-dimensional approach with an appropriate suite of outcome measures

An evaluation of an initiative such as the CDMP needs to recognise that the program goes well beyond any particular intervention, relying on system change. As such, the impact of the program is likely to be multidimensional, and the evaluation needs to similarly be multidimensional. The core dimensions in health and social programs are likely to be consumer experience, cost/efficiency and effectiveness/outcomes.

A significant weakness in the current Evaluation is the absence of patient experience data. Patient experience is important for a number of reasons. Patients are clearly central stakeholders in health service improvement initiatives. They can also be a significant and active element of the intervention, as is the case with chronic condition management for instance, not just a passive recipient.

Patient experience data also provide the opportunity for much greater choice in outcome indicators. In the current Evaluation service utilisation patterns provided the outcome measures of interest. There are robust alternatives – self-reported health status, health-related quality of life, independent living for example – which are equally important and might show very different outcomes to those found here. The importance of these types of measures has received significant attention in the international literature in the context of value-based healthcare, where the focus is on value rather than only on cost savings.

Timeliness

A shortcoming of the Evaluation was its lack of timeliness. Quantitative data and analysis became available after several years of Program operation. Similarly, by the time the rounds of process evaluation became available, the programs had already adapted/evolved without the benefit of more complete data.

The issue of timeliness to some extent reflects a widely held view of how best to evaluate interventions where much of the knowledge about the processes and impacts is held locally by those most involved in delivering the change. The evaluation needs to be embedded in the innovation, to become an active ingredient in the cycle of continuous improvement. The impact of hospital-avoidance interventions should be monitored in as close to real-time as possible. If they are not effective, it might be possible to refine their intervention or connected services in order to improve effectiveness.

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Routine data collections will however never fully articulate some critical nuances of drivers of success in local innovation. Ethnographic and observational data - as collected in the Aboriginal evaluation component – should be used to focus on elements such as leadership, how professionals and service users interact, and how work is re-organised in reality as opposed to on paper, and have the potential to offer valuable insight with more intense data collection, and provide benefit in the unpacking of the ‘black box’.

Designing programs with evaluation in mind

Ultimately the aim of evaluation in health and social programs is to help understand what works, what does not work, how much it works relative to what it costs, and why. Through providing such understanding, evaluation has the potential to become a core component, a driver even, of
continuous improvement. In order to fulfill its potential in this regard, evaluations are most valuable when they program has been designed with its evaluation in mind. The essential starting point is a program that is designed with its assumed causal connections specified. As an example, a central element of the CDMP was care co-ordination. The benefits of co-ordination may not be potentially preventable hospitalisation. Rather it might have its beneficial effects via reduced duplication resulting in greater efficiency for the system and reduced strain for the patient and provider. At the same time there must be room for adaptive variation, acknowledging that health and social programs are evolutionary.

The process of explicitly articulating, and re-assessing the assumed connections between program components and outcomes can be called a theory of change, a program theory, a theory of action, or a logic model. The literature on this subject is vast, and terminology varied. The approaches all converge on the same premise: articulating the logic of the assumed connections linking the program components to the outcomes provides the basis for an incisive evaluation.

The need for support for systematic development of chronic care across existing systems

The CDMP confirms that there are a very large number of people with chronic conditions, many with co-morbidities. Current services are often fragmented, and many deal with single conditions. All suffer from the same deficits in clinical and patient management systems. The overall aim should be to strengthen the system of chronic disease care as a whole and better integrate existing systems rather than rather than focus on new services (although these may also be needed). The CDMP suggests that this will require considerable investment in infrastructure, training and re-orienting the system to a chronic rather than acute focus.

The need for support for local development

The CDMP has shown the importance of tailoring a program to suit local circumstances, while still providing overall direction. While it may seem obvious in theory that CDMP activities should be scaled to match local capacity, this was not always the case in practice. In some cases, enthusiastic local leadership produced expectations that were difficult to realise in practice. Changes to practice often took much longer to achieve than anticipated.

One approach is to adopt functional specifications and provide guidance on the evidence relating to each function, leaving it to the service to determine how this is best done. The thinking here is that functional requirements designate what is to be achieved, recognising that how they are to be achieved will vary by local characteristics. A potential functional description for the CDMP is given in Error! Not a valid bookmark self-reference. below.
An overwhelming feature of the Program overall was low levels of engagement with primary care, including GP and ACCHSSs, who deliver a model of comprehensive primary health care for Aboriginal people which includes a major focus on chronic disease prevention and management.

105 Includes ease of access, evidence based, comprehensive, patient centred and supportive self management,

106 This may include being identified and treated appropriately if presenting to ED or being re-admitted to hospital.
Yet, this Evaluation suggests that acute care is not the best place to identify people who could benefit from care coordination and health coaching. By the time they are identified it is too late: their condition has already been significantly exacerbated, and indeed many are already on the road to recovery, with or without extra intervention.

Risk stratification can be used in primary care to identify people at risk of hospitalisation and appropriate preventive measures put in place. Risks are likely to be better understood and preventive measures better implemented in primary rather than acute care. A recent review of care management programs by the Commonwealth Fund\(^{107}\) noted that selecting patients based on high utilisation of acute care missed high-risk patients who do not use acute care and did not identify the factors that drive admissions. Another recent analysis of chronic care management programs in the UK, Netherlands and Germany found that the German system, which took a whole of population focus and integrated chronic disease management into normal funding and care, had the best combination of health outcomes and cost savings.\(^{108}\) Extending into primary care also makes it easier to link people back into GP for their ongoing care.

In the current Australian health care system it is challenging for a state health system to invest in primary care, or for the Commonwealth and state to work in partnership to improve care. However taking even small steps in this direction may be useful, and the development of Primary Health Networks provide an opportunity to do so. The model of proportionate universalism\(^{109}\) shows in high-level terms how a system based in primary care might work, and the role that more acute services could play.

Figure 90 The model of proportionate universalism

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The main emphasis of the program is on developing a strong universal system (largely GP) which provides care that is proportional to the needs and the capacities of those that use it, with extra support for those with high needs or limited personal or social capacity. There is also a focus on building individual and community capacity, so that they can contribute more effectively to their care. The focus moves outside this universal system only when care needs become too complex or demanding. The first step then, where possible, is for the targeted (more acute) service to provide consultancy and support for the universal system, and only to take the person away from this when this is necessary. The aim should be to return the person to the universal system as soon as possible, with links in place for any future episodes needing enhanced care.
5 Appendices

5.1 Findings of in-depth case studies of the process evaluation – Mid-term process report

STATE-WIDE EVALUATION

NSW Health Chronic Disease Management Program

MID TERM PROCESS EVALUATION REPORT
July 2013

UNSW research centre for primary health care & equity
Research that makes a difference
# Table of contents

## Contents

- **Abbreviations** ........................................................................................................... A
- **Acknowledgements** ................................................................................................. 173
- **Table of contents** ..................................................................................................... 172

1. **Executive summary** ............................................................................................ 175
2. **Introduction** ......................................................................................................... 177
   - 2.1 Background ........................................................................................................... 177
   - 2.2 What this report covers ....................................................................................... 178
3. **Methods** .................................................................................................................. 179
   - 3.1 Aims and purpose of evaluation .......................................................................... 179
   - 3.2 Logic model .......................................................................................................... 179
   - 3.3 Methods and time line ........................................................................................ 180
4. **Findings** .................................................................................................................. 182
   - 4.1 Program governance and management ................................................................ 182
   - 4.1.1 Governance arrangements .............................................................................. 182
   - 4.1.2 Collaborative operational management structures .......................................... 183
   - 4.2 Collaborative service development and delivery ................................................. 184
   - 4.2.1 Development/design and review processes ...................................................... 184
   - 4.2.2 Integration mechanisms ................................................................................... 186
   - 4.3 Model of care ....................................................................................................... 190
   - 4.3.1 Systems for identification, stratification and enrolment ................................... 190
   - 4.3.2 Intervention ...................................................................................................... 191
5. **Discussion** .............................................................................................................. 196
   - 5.1 Overview of developments since initial scan and the enablers ............................. 197
   - 5.2 Variations in the model of care ........................................................................... 199
   - 5.3 Opportunities for development .......................................................................... 201
   - 5.3.1 Summary suggestions for the Program ............................................................. 202
6. **Appendix: Case study site selection criteria** .......................................................... 204
Acknowledgements

We would like to thank the Program Managers in each Local Health District for their support in organising the on-site visits by the evaluation team and for their participation in the evaluation. Our thanks extend to all the staff, other clinicians and service providers, and community representatives who so willingly gave their time and their input to this evaluation. Their readiness to share their experiences, perceptions and wisdom and trust in us meant allowed us to explore in some depth the issues that arise in implementing a complex and multifaceted program. We also appreciated the opportunity to test our ideas with staff from the Agency for Clinical Innovation.

This report was written by the team which undertook this mid-term process evaluation: Julie McDonald, Gawaine Powell Davies and Tom Powell Davies from the Centre for Primary Health Care and Equity, UNSW.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full name</th>
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<tbody>
<tr>
<td>ACCHS</td>
<td>Aboriginal Community Controlled Health Services</td>
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<td>ACI</td>
<td>Agency for Clinical Innovation</td>
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<tr>
<td>ARGUS</td>
<td>Electronic secure messaging system</td>
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<tr>
<td>CCAP</td>
<td>Chronic Care for Aboriginal People</td>
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<tr>
<td>CCSSP</td>
<td>Complementary Care and Supplementary Services Program</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<tr>
<td>CERNEr</td>
<td>Hospital IT system</td>
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<td>CHIME</td>
<td>Community Health Information Management Enterprise</td>
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<td>ED</td>
<td>Emergency Department</td>
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<td>EMR</td>
<td>Electronic Medical Record</td>
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<td>GP</td>
<td>General Practitioner</td>
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<td>GPMP</td>
<td>General Practice Management Plan</td>
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<td>GPNSW</td>
<td>General Practice NSW</td>
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<tr>
<td>HARP</td>
<td>Hospital Admission Risk Program tool</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>ID</td>
<td>Identification</td>
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<td>IPM</td>
<td>In Patient Management system</td>
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<td>ITM</td>
<td>Information Technology and Management</td>
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<td>LHD</td>
<td>Local Health District</td>
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<td>MDS</td>
<td>Minimum Data Set</td>
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<td>ML</td>
<td>Medicare Local</td>
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<td>NBN</td>
<td>National Broadband Network</td>
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<tr>
<td>NGO</td>
<td>Non-Government Organisation</td>
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<tr>
<td>ONI</td>
<td>Ongoing Needs Identification tool</td>
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<tr>
<td>SMS</td>
<td>Self-Management Support</td>
</tr>
<tr>
<td>VMO</td>
<td>Visiting Medical Officer</td>
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Executive summary

This is a report of the mid-term process evaluation of the NSW Chronic Disease Management Program – ‘Connecting Care in the Community’. It involved in-depth case studies conducted between February-April 2013 in seven Local Health Districts covering metropolitan, regional and rural areas. Semi-structured interviews were held with a range of staff from Local Health Districts and Medicare Locals and other health care service providers. The evaluation examined governance and management arrangements, the design and development of the program, including developments within Local Health Districts and with Medicare Locals, and the model of care being implemented.

The evaluation found Programs were more developed since the initial state-wide scan undertaken in late 2011. Significant areas of progress included implementation of systems for identifying and enrolling patients. A key enabler was the existence or establishment of centralised intake and referral centres (contact centres). Developments in information technology and management systems enabled information to be shared between providers across the Local Health District and with Medicare Locals and/or general practitioners (GPs). Structured telephone health coaching was well established in several Local Health Districts, and referral pathways between the Program and other services, especially rehabilitation, were supporting a more integrated approach to chronic disease management.

There was considerable variation in the model being implemented across Local Health Districts and the extent to which care was coordinated across sectors. The local context, including capacity, systems and relationships has influenced the developments. The Program has evolved over the 12-14 months from an initial focus on enrolment of individual patients to a more patient population approach to chronic disease management, at least within the patient population of Local Health Districts.

A mix of state-wide and local opportunities and suggestions for developing the Program during the next phase of implementation are offered.

State-wide Program

1. Define and communicate the primary focus of the Program. Is it primarily for patients of the NSW health system (with some assistance from other services), OR as a program for the population as a whole, is it also primarily for the patients of GPs? Determining the primary focus will help clarify the role of different services in the Program, and so the extent to which it needs to be designed to meet their needs as providers of chronic care. This will then need to be clearly communicated to all stakeholders and to inform future redesign and Program development at state and local levels.

2. Use the development of the service model to articulate a wider range of streams of care: for example different levels and intensity of health coaching, self-management support and care coordination. A more varied approach can better meet the changing needs of individual patients (providing that there are paths for moving between different levels), and help cope with increasing levels of enrolment and limited resources.

3. Improve coordination between the public (i.e. Local Health District) and private (i.e. primary care) sectors. Focusing the effort and investment in one sector only risks of increasing fragmentation between sectors, even though coordination may be enhanced within one sector. Examples of effective strategies include: multi-sector management of the program as a whole; strong linkages between contact centre Program staff and Medicare Local-based care coordinators; funding both Medicare Local and Local Health District-based care coordinators where there is no contact centre.
infrastructure able to take on this role; and modelling a partnership approach in all Program promotion and communication strategies.

4. Use the state-wide development of electronic medical record (EMR) systems as an opportunity to develop better systems for identifying and following up enrolled patients who represent to hospital, before they are discharged.

Local Programs

5. Develop care pathways to better integrate the different elements of the Program and to link the program with other chronic disease management services. These can also support timely identification and referral of patients, reactivation for patients who may need further support before they represent to hospital; and enable patients to shift between levels of care as their needs change.

6. When improving information and communication systems, include change management programs to encourage clinicians to use the shared clinical information to support patient care.

7. Improve systems for identifying and following up patients who re-present to hospital, prior to their discharge.

8. Improve systems and protocols for ongoing follow-up of ‘non-active’ clients, and monitoring adherence to care.

9. Develop systems for routine monitoring and review of care received by enrolled patients, including waiting times between enrolment and assessment; and waiting times for and/or gaps in services.
Introduction

2.1 Background

The NSW Chronic Disease Management Program – ‘Connecting Care in the Community’ - is an initiative of the NSW Government. The Program is being rolled out over 5 years through to 2015 with funding of $177 million.\(^{110}\)

The aim of the Program is to better connect the care and support of people with chronic diseases who have been hospitalised or are at risk of potentially preventable and unplanned hospitalisation due to their chronic diseases. The Program recognises that hospital admissions related to chronic disease are often preventable if care in the community is provided. Through delivering integrated care to people directly within the community, reliance on acute care services for potentially preventable hospitalisations could be reduced. Providing care coordination and self-management support such as health coaching could empower patients to better understand and manage their conditions, improve patient outcomes and support more efficient use of healthcare resources in NSW.

This same time period has seen significant health system and governance reform in Australia, both at the Federal level and in NSW\(^{111} \text{,}^{112}\). The NSW health system has seen the devolution of health service planning to Local Health Districts and establishment of Medicare Locals as new regional level primary health care organisations sitting between government and primary care providers. This new playing field in health service delivery has had a significant impact on the establishment and implementation of the Program and associated infrastructure at the central, regional and local levels.

The Program achieves its aims by supporting people with chronic disease, and their carers, to better navigate the health system. The Program spans sectoral boundaries to deliver better coordinated, person-centred care for people with chronic disease and complex needs across multiple care providers and settings. It specifically focuses on enabling the primary health care sector to provide continuity of care by facilitating linkages with community health and specialist medical services including generic and disease specific rehabilitation programs, Aboriginal chronic disease programs such as 48 Hour Follow Up and Closing the Gap programs, aged care and disability services, and mental health and drug and alcohol services.

NSW Health has supported the implementation of the Program through a range of initiatives including:

- Funding for Local Health Districts (LHDs) to support:
  - the employment of staff (which has occurred in both Local Health Districts and Medicare Locals);
  - staff training in self-management support;
  - local procurement of health coaching, IT services to support health coaching, and tele-monitoring.


• Establishment of panels of providers to support Local Health Districts in the above procurement processes.
• Funding for a position with GPNSW to support Program development in Medicare Locals.
• Funding of the development of a state-wide primary health services directory (this information was used in the development of the National Health Services Directory, which has now superseded it).
• Funding of a full program evaluation to support monitoring and ongoing development.
• Development of a Minimum Data Set (MDS) to support reporting, monitoring and evaluation.
• Customisation of the Patient Flow Portal to support identification of potential enrollees.
• Convening governance and advisory structures (including the Program Steering Committee, periodic state-wide workshops/conferences, monthly implementation network teleconferences, the Chronic Disease NGO Roundtable).
• Development of patient information resources.

Original planning also included consideration of some other initiatives to be developed centrally to support the program e.g. a state wide after hours service and a web based portal to house shared care plans and a state-wide directory of services. However, these have not currently been progressed. Overall Program funding, accountability and governance was initially the responsibility of the Chronic Disease Management Office in the Ministry of Health. Following the governance review of NSW Health, primary responsibility for Program implementation and development has been transferred to the Agency for Clinical Innovation (ACI). It should be noted that during this period of restructure and transition, the respective roles and responsibilities of the Ministry and ACI for the Program took time to evolve.

2.2 What this report covers

This report presents the results of the mid-term process evaluation that involved in-depth case studies of seven Local Health District programs using qualitative methods. The next section covers the methodology, followed by the findings, structured according to the major Program components of a) governance and management, b) collaborative service design and delivery, and c) the model of care. The final section draws the findings together into a discussion of the major developments since the initial scan, the emerging models, variations and implications and the major enablers. The section finishes with suggestions for the future development of the Program.
Methods

3.1 Aims and purpose of evaluation.

The evaluation assesses the processes, impacts and outcomes evaluation of the Program over a four year period, using mixed methods. The primary objective of the evaluation is to measure the impact, reach, equity and costs of the Program. The process evaluation, to which this report contributes, aims to:

- describe the way in which the Program has been implemented at Local Health District and/or Medicare Local level
- describe staff views of the strengths, weaknesses and achievements of their program
- describe staff satisfaction with their program and their roles in it
- identify differences in the way the program has been implemented which may explain differences in reach, effectiveness, costs or benefits, patient or provider satisfaction, including any variations from the prescribed Program
- derive lessons which may be relevant to similar programs or initiatives

3.2 Logic model

A logic model was developed to guide the process evaluation. This describes the key evaluation domain areas and the elements within them and the relationships. The key domain areas are: program governance and management, the model of organisational collaboration and the model of care. The evaluation logic informed the scope and focus of data collection and the analysis. The specific analytic questions that the process evaluation set out to address were:

- What variations in implementation impact on achieving intermediate outcomes and explain the variation in program performance?
- What contextual factors (including demographics, history etcetera) influence the variations in implementation?
Figure 1: Logic Model

3.3 Methods and time line

The mid-term process evaluation involved in-depth qualitative case studies of seven Local Health District programs. A formal process informed the selection of the case studies. This process involved defining explicit selection criteria that related to location (metropolitan and rural Local Health Districts) and performance against selected program functions (see appendix). Each Local Health District program manager was invited to rate their Program against each of the core functions. This was supplemented by ratings from the Ministry of Health, Agency for Clinical Innovation, GPNSW and the evaluation team. The results were discussed by the evaluation team and six Local Health Districts were selected to ensure a spread across that covered both across metropolitan and rural areas, and that represented differences in implementation. An additional Local Health District was selected to pilot the process. This pilot involved an interview with the program manager and a one-day site visit. The results from the pilot have been included in the findings.

Data collection involved an initial 2-hour telephone interview with the program manager in each site. This was supplemented by a 3-day site visit and a series of semi-structured interviews with a range of people involved in the program including dedicated program funded staff, managers and staff from other chronic disease management related programs, health care professionals and Medicare Locals. In some Local Health Districts interviews were organised with GPs, medical specialists, consumer representatives and other key stakeholder groups and organisations.
Data was entered into spread sheets in a summary form for thematic analysis within and across program domain areas. Cross-case comparisons were undertaken to identify similarities, differences and patterns in implementation.

Descriptive summaries for each Local Health District were developed and provided to each Program manager for their comment and internal use. Three of the seven Local Health Districts provided feedback and this process helped to ensure any factual errors in the analysis were corrected.
Findings

The findings are structured into three major sections according to the major Program elements and domains described in the logic model. This section starts with summarising key aspects of governance and management of the program at the Local Health District level and in collaboration with Medicare Locals, and includes findings on governance arrangements, leadership and operational management structures. The next section describes the ways in which the Program has been designed and developed and the major infrastructure enablers. The final section describes the model of care according to systems for identification and enrolment; the models of care coordination and self-management and/or health coaching and systems for monitoring and follow up of individuals enrolled in the Program. Each section finishes with a summary of the key strengths and areas for development.

4.1 Program governance and management

- 4.1.1 Governance arrangements

Breadth of engagement and links with chronic disease related networks
Most programs had some form of governance structure. The two major approaches were standalone and integrated. Examples of the latter approach included an overarching chronic disease reference group or Local Health District/Medicare Local partnership structure within which the Program was governed; and a single steering committee that encompassed the Program and other related care coordination programs, for example, Chronic Care for Aboriginal People (CCAP).

The breadth of membership supported relationships and linkages between the Program and other chronic disease related initiatives. Most steering committees had representation from a range of Local Health District programs and services, including community health, specialised chronic disease programs, Aboriginal health, and aged care. The broadest representation went beyond specific chronic care programs to include population health and palliative care. All steering committees involved representation from Medicare Locals, commonly through CEOs, but only a few had actively engaged Aboriginal Community Controlled Health Services (ACCHS) in shared governance arrangements. Relationships and linkages were more commonly addressed at the operational level. Governance linkages with chronic disease related networks can also support integration and this was beginning to happen in several Local Health Districts.

Role of governance structures
Most but not all governance structures were responsible for promoting and supporting the program, setting strategic directions and responding to emerging issues. In some places they operated as reference groups with more an advisory than decision-making role. In lieu of a functioning steering committee in one Local Health District, strategic decisions were made by the Tier 2 sponsor in conjunction with the Director of Primary and Ambulatory Care and the operational management committee.

Leadership, visibility and significance
There were few differences between the type of governance structures and active leadership for the program. In both the standalone and more integrated models, there were examples of active executive leadership and support, where the Program was viewed as a significant contributor to the Local Health District’s directions.
and focus and partnership development with Medicare Locals. Executive level support also helped to protect the Program in times of budget cuts and recruitment freezes. More integrated structures have the potential to strengthen linkages between programs, but may also reduce the focus if other priorities take precedence. There was the perception in at least one site that the broader focus meant at times there was less attention given to Program issues that needed particular focus.

The extent to which Medicare Locals saw the Program as significant for their organisations varied and this influenced their level of engagement and commitment. Some Medicare Locals viewed the Program as significant for developing their partnerships with Local Health Districts, and for furthering what they saw to be their core business – i.e. the coordination of primary health care services. Those Medicare Locals which had less direct involvement in the Program and/or were less satisfied with how it had been implemented tended not to rate it as being significant for themselves or for general practices in their area. This was due to a combination of factors including the internal focus by Medicare Locals on developing their organisational structures and capacity; perceptions that the Program did not address GP concerns or issues; and a lack of Medicare Local-based care coordinator positions to support linkages between general practice and the Local Health District.

Programs not perceived to be as significant by the Local Health District executive compared to other priorities or initiatives had sometimes struggled to gain traction. In those places it was difficult, for example, to obtain the support required to develop the infrastructure. In one place the Program was not seen as significant by the executives of the Local Health District or the Medicare Locals. This made it difficult to establish effective linkages across the sectors. In those situations where the governance structures were not adequate for engagement and collaboration, Program staff worked around the limitations as best they could.

- **4.1.2 Collaborative operational management structures**

In most sites the operational management group was relatively narrow in its breadth and comprised core Local Health District staff with responsibility for Program management and implementation. To compensate for the lack of explicit Medicare Local representation, some sites, notably those where there were Medicare Local-based care coordinators, had other arrangements for collaborating on operational management and development issues. Three sites had broader representation from other chronic disease related programs and Medicare Local-based care coordinators.

The roles of Program managers varied. In some places they had a strategic role; in other places they had a dual strategic and an operational role; and in two sites, they had an operational role, but worked closely with more senior managers who had strategic responsibility.

**Key strengths**

Broader representation from other chronic disease management related programs and Medicare Locals on the governance and decision-making structures encourages a collaborative approach and fosters buy-in.

Having shared management structures can facilitate strengthened linkages with related programs.

**Areas for development**

Greater understanding of the benefits of participation as perceived by GPs and Medicare Locals and incorporation of these perceptions in Program planning and developments.
4.2 Collaborative service development and delivery

4.2.1 Development/design and review processes

Differences were found in the focus and emphasis of developments that supported implementation. These included:

- strengthening Local Health District capacity across the board or in particular areas;
- strengthening the role of Medicare Locals and general practices; and
- developments across Local Health Districts and Medicare Locals.

Programs also differed in their approaches to Program review.

Strengthening Local Health District capacity

The major capacity building areas included: investment in contact centres, an expanded model of care, linkages with other chronic disease management related programs, telephone services, enhancing access, and addressing gaps.

Contact centres

Several Local Health Districts invested in contact centres that centralised intake and referral procedures. Some sites had invested in these prior to the Program, and had to a greater or lesser degree redesigned them to incorporate Program requirements. This involved investing in staff, equipment and information systems, reviewing policies and procedures, and training. In other sites, their development was initiated as part of the Program. See also section 4.2.2.

Expanded model of care

Two Local Health Districts developed an expanded model of care that involved three levels or streams of increasing intensity, although each Local Health District defined these streams differently. Whereas the more rural Local Health Districts adopted a single model of care that incorporated self-management support as part of the care coordination model in which either the Local Health District or Medicare Local was the lead agency.

Linkages with other chronic disease management programs

Most Local Health Districts were strengthening linkages with disease specific rehabilitation programs through one-off funding enhancements, developing agreed referral pathways and clarifying roles. The provision of small grants contributed to building goodwill and relationships. Referral pathways initially focused on enrolment in the Program as a rehabilitation exit strategy. Pathways have been more difficult to achieve where programs had a more ongoing than time limited rehabilitation role and agreement could not be reached on the respective roles.

Telephone services

Three Local Health Districts had developed the capacity of community health services to provide telephone support and follow up or telephone health coaching. Most of these developments were centralised in the contact centres, which were consequently having a broader role and function. Those developments to strengthen integration of intake and referral functions contributed to the sustainability and efficiency of the Program, more so than where these functions remained separate and dispersed among different Local Health District services and more reliant on individuals.
Enhancing access

Developments to enhance access took several forms, and mostly focused on disadvantaged or vulnerable groups. A number of Local Health Districts strengthened linkages with 48 hour Aboriginal follow up through sharing and/or co-location of positions in the contact centres and/or defining referral pathways. Establishing linkages was facilitated where both programs sat under a common management structure, and was more difficult to achieve where they were in different structures. One site has had an explicit focus on enhancing enrolments for people with co-morbid mental health conditions and culturally and linguistically diverse communities. Project officers were employed to develop strategies and linkages with mental health services, the multicultural health unit and health care interpreter service. A particular area of innovation was the adaptation of the Arthritis NSW ‘Moving On’ community-based and run self-management support program for selected culturally and linguistically diverse communities.

Addressing service gaps

Some Local Health Districts have identified and addressed specific service gaps, for example the lack of rehabilitation services. This involved funding rehabilitation programs in a number of small rural towns and employing allied health assistants to support these programs. These programs were integrated with the Commonwealth Department of Health and Ageing’s Rural Primary Health Care initiative. The shifting of this funding to Medicare Locals was necessitating changes to these arrangements.

No Programs systematically identified the right mix, volume and distribution of services required to meet the needs of enrolled patients. Anecdotally the lack of availability of home care due to high demands and/or eligibility criteria that excluded some groups, particularly those aged under 65 years, was consistently identified as a gap, but there was no data that quantified or described the magnitude of the problem. Often the only way that care coordinators heard that services were not available or received was via patients or when they were readmitted to hospital.

Strengthening the role of Medicare Locals and general practice

Most Local Health Districts had a greater or lesser focus on supporting Medicare Locals to implement the Program. This support took two forms:

a) funding Medicare Local-based care coordinators to obtain GP Management Plans (GPMPs) which formed the basis of the shared care plan;
b) funding Medicare Local-based care coordinators to work with general practices to develop GPMPs and supplementary plans and support the coordination of the care outlined in these plans.

The numbers of patients that each Medicare Local took an active care coordination role varied within and between Medicare Locals. This variation related to how the care coordination role was defined. Most Medicare Locals saw that the reach and sustainability of the model could only be achieved through improving the capacity of general practice to take on a greater care coordination role. The roles of practice nurses were central to this, but there were also challenges: ensuring a financially viable and sustainable business model; that practice nurses have the capacity to take on this additional role; and equity considerations for patients of practices which do not have access to practice nurses. One Local Health District partly addressed this issue by providing time limited practice nurse funding enhancements to support uptake of the Program. This site also funded a GP advisor position in the Medicare Local to champion the Program, including the uptake of ARGUS, by GPs and provide mentor ship for the care coordinators.
Developments across Local Health Districts and Medicare Locals

The major areas were information sharing and referral pathways and the availability of health coaching.

**Information sharing, referral pathways**

Several Local Health Districts invested in systems to support information sharing and communication with Medicare Locals. This took two major forms: developments to CHIME and providing Medicare Local-based care coordinators with access; and developing ARGUS as the major way of sharing information with GPs (see section 4.2.2). Several sites also incorporated the Program into care pathways being developed as part of the ‘Canterbury HealthPathways’ approach.

**Health coaching training**

All Local Health Districts provided health coaching training to a broad range of Local Health District clinicians and care coordinators, and in some places this was extended to practice nurses. The reach beyond this was limited. Few sites made health coaching available to other service providers, e.g. ACCHS or to clinicians in Medicare Locals who were involved in the provision of primary health care services (e.g. allied health professionals, coordinated care programs). No Local Health Districts had systematically looked at how this training was being implemented, articulated expectations, or put in place supervision and other arrangements to support its implementation and sustainability as part of clinical practice. One Program has established health coach peer leaders who will take on this role, in addition to a health coaching case load.

**Program review**

Care coordinators relied on their networks and relationships and their powers of persuasion to negotiate the plethora of services and differing eligibility criteria to find the services for clients. There were few service directories that pulled this information together in an accessible and up to date form, although some Medicare Locals saw this as a priority to develop as part of their core role in supporting primary health care.

The focus of most Program-level review activities was to improve the quality and consistency of Local Health District processes, procedures and documentation, especially in relation to the Minimum Data Set. Some Programs had undertaken workforce reviews and in one Program this led to the employment of Local Health District-based care coordinators to complement the Medicare Local-based positions. One site also reviewed the role and caseloads of the care coordinators.

Less than half the Programs had evaluated the impact of the Program on length of stay and emergency department admissions and those that had focused on only a small cohort of patients. The indications were that the Program was having a positive effect and the results were helping to bring on board particularly specialist chronic disease services who had been less involved.

- **4.2.2 Integration mechanisms**

The major areas of development included: the employment and location of care coordinators; integration of intake, referral and monitoring functions as part of single points of entry to community health services; systems for information sharing and communication; and decision support tools.
Care coordinators
Four sites had care coordinator positions based in both Medicare Locals and Local Health Districts. They generally had different roles which contributed to improved coordination between sectors. The roles of Local Health Districts positions focused on identification of eligible patients, registration, enrolment, risk stratification and referral, whilst the Medicare Local-based positions were more involved in comprehensive needs assessment, shared care planning, and associated care coordination functions. One Local Health District also provided telephone support for patients not referred to Medicare Local for care coordination. In one site the Medicare Local positions focused on liaison between GPs and the Local Health Districts in relation to the GPMP, with the Local Health Districts undertaking most of the care coordination functions.

In the one site with no Medicare Local-based positions, the Local Health Districts care coordinators linked directly with local GPs and there were few linkages with chronic disease related programs and services or practice support functions of the respective Medicare Locals.

Sites with no Local Health District-based designated care coordinator positions had contact centres which through their registration, risk stratification and referral functions assisted integration within the Local Health District and with general practice through the Medicare Local-based positions.

In rural areas, the Local Health District care coordinators were predominantly located on hospital campuses. This had two major benefits. It enabled the care coordinators to have good access to the emergency departments, wards and ambulatory care settings to identify and follow up eligible and enrolled patients. It also facilitated informal communication and information sharing with, and the development of, inter-professional trust and relationships between hospital and community health staff and with GPs who were Visiting Medical Officers (VMOs).

Contact centres
Five sites had centralised community health contact centres. In most sites the Program positions with responsibility for identification and registration of clients were co-located in these centres and many were shared positions. The 48 hour Aboriginal follow up positions were also co-located with the contact centres in two sites which facilitated linkages. In two Local Health Districts, contact centres were the location for the provision of telephone health coaching or support and follow up for enrolled clients.

Systems for information sharing and communication
The systems can be categorised into patient flow information, secure messaging, and shared clinical records.

Patient flow information
The stage of development of the information technology (IT) infrastructure either enabled or limited the capacity of the system, for example, to identify representations of enrolled patients or to generate recall/review lists for active patients. Some places were able to identify eligible patients and re-presentations of enrolled patients in real time, whilst others relied on discharge reports.

Secure messaging
Most programs relied on ARGUS for secure messaging within the Local Health District and with general practice and four Local Health Districts provided funding to enhance its uptake. Two sites provided GPs with incentives, including paying licence fees and training to support ARGUS use. Despite the enhanced availability and incentives, take up and use was variable: not all Local Health District clinicians used it for communicating
with external providers. In over 50% of sites, the take-up by general practice was limited and its major use was for sending discharge summaries.

**Shared clinical records**
The extent to which clinical records were shared among providers varied between and within Local Health Districts and with GPs. It was most highly developed in Local Health Districts where the existing IT infrastructure (EMR/CERNER and CHIME) was an enabler. The use of CHIME and read access was extended to a range of rehabilitation programs, aged care services (e.g. ASETs), and Medicare Local-based care coordinators. In one Local Health District for example there was a shared IT platform (Clinical Access Portal) which could be accessed by all Local Health District staff, Medicare Locals, and VMO GPs. This platform provided access to a broad range of clinical information and to the EMR (used across all hospital sites) and to CHIME (used across all community health services and rehabilitation programs). In contrast, in a rural site the use of EMR and CHIME was limited to larger sites and in one metropolitan Local Health District there were multiple platforms. In the latter instance, this was partly overcome by the use of CERNER by the care coordinators and contact centre staff, which assisted with information sharing in the Local Health District, but not with general practice. In the rural site mentioned, there was a greater reliance on phone calls and fax for sharing information between different services within the Local Health District and with general practice.

**Decision support tools/pathways**
A range of assessment tools were used to inform the assessments, although none were validated. The most commonly used instruments were HARP and ONI. A number of Local Health Districts and Medicare Locals also developed specific assessment guidelines/tools.

While most Programs attempted to build on the GPMP as the optimal shared care plan, most care coordinators (either based in Medicare locals or local Health Districts) also developed supplementary goal oriented care plans to support the planning and coordination of care.

Increasingly the Program was incorporated into clinical care pathways which was contributing to its reach and sustainability. This was the case in several sites which adopted the ‘Canterbury HealthPathways’ program. Formal care pathways with rehabilitation services were developed and refined in a number of areas as the linkages and relationships strengthened and built on the less formal approaches. In most places the more explicit care pathway involved referral at the completion of rehabilitation for ongoing monitoring and follow up or telephone coaching/SMS. The development of pathways was less clear and harder to negotiate where rehabilitation programs were more ongoing than time limited, and had an ongoing patient care and coordination role.

The other focus has been documenting referral pathways in and out of the contact centre and risk stratification and allocation processes. While care pathways have been developed that detail the role of the Program in the coordination of care for eligible patients, further work is needed to embed these pathways as part of accepted practice, especially amongst some rehabilitation and chronic and complex care programs.
**Key strengths**

Designated coordination functions in both Medicare Locals and Local Health Districts contributes to improved coordination across sectors.

Opportunities for co-location of care coordinators on hospital campuses allows for good access to emergency departments, wards, etc., which enables the identification and follow-up of eligible and enrolled patients. It also facilitates informal communication and information sharing. This works particularly well in rural areas, given the centrality and scale of base hospitals.

Co-location of the Program with related programs (e.g. 48 hour follow up) fosters integration.

Flags and alerts for re-presentation of enrolled patients facilitates timely follow up by care coordinators and greater continuity of care.

The development of shared clinical records supports integration between chronic disease management programs.

Strengthened integration of intake and referral functions (e.g. through a contact centre) contributes to the sustainability and efficiency of the Program, compared with where these functions are separated and dispersed across Local Health District services.

A stratified model of care has the potential to respond to increasing numbers of enrolments by offering different levels of care and support.

**Areas for development**

The use of secure messaging systems facilitates communication with GPs however much work is still to be done to encourage take up and use by GPs and Local Health District clinicians.

The incorporation of the Program into care pathways contributes to the program’s reach and sustainability and further work is required to document referral pathways, starting with entry into the Program.

Ongoing work is required to develop agreed referral pathways and role-clarification between the Program and other chronic disease management related programs and services.

Improving the capacity of general practices to take on a greater care coordination role.

An expanded model of care that incorporates different streams and levels of care coordination may be more able to respond to increasing numbers of eligible clients.

Systematic responses to in-house health coaching training, including detailing expectations, approaches to incorporate into clinical practice, supervision and mentoring.

Systematic approaches to identifying the mix and range of services required and identifying service gaps; including access and availability issues.

Development of comprehensive service directories and systems for maintaining.
4.3 Model of care

- 4.3.1 Systems for identification, stratification and enrolment

**Identification**

Eligible patients were mostly identified by monitoring hospital admission or discharge lists, or via referrals. While each Local Health District employed some combination of the two approaches, there was a tendency to be oriented towards one more than the other. GP referrals, while still a small proportion of the referrals overall, were slowly increasing as GPs became more engaged with the Program. An on-line portal was developed in one Local Health District to support GP referrals.

In four Local Health Districts, real-time daily lists for patients with 3+ admissions were monitored by a range of staff including contact centre-based care coordinators, registered nurses and administrative staff. In districts where Program staff could access to real-time information and were located at hospitals, the identification of eligible patients was often followed up with ward visits and meetings with hospital staff. In at least two sites, there were Program funded positions at specific hospitals whose role included identifying groups of eligible patients (e.g. suitable for health coaching, or those with complex physical and mental health co-morbidities).

Local Health Districts which provided access to telephone health coaching services, ran regular post discharge reports to identify eligible patients. These reports were interrogated by a mix of administrative and clinical staff.

**Stratification**

In most places, Program-designated staff reviewed patient lists/referrals for eligibility and, using decision-support tools, undertook an initial assessment. The following table summarises the level of care into which patients were initially stratified based on the results of the initial needs assessment.

<table>
<thead>
<tr>
<th>Level of care</th>
<th>Numbers of Local Health Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone support</td>
<td>1</td>
</tr>
<tr>
<td>Health coaching / self-management</td>
<td>1</td>
</tr>
<tr>
<td>Structured telephone health coaching</td>
<td>4</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>1</td>
</tr>
<tr>
<td>Care coordination</td>
<td>7</td>
</tr>
</tbody>
</table>

In three Local Health Districts, patients were stratified into either care coordination or telephone health coaching streams developed as part of the Program. One Local Health District developed an additional stream of low level telephone support into which patients were referred. Two Local Health Districts referred patients to either care coordination or to existing health coaching/SMS or new rehabilitation services developed a part of the Program and the remaining one Local Health District referred patients to a single model of care coordination.

**Enrolment**

Enrolment processes varied and was done by a mix of contact centre staff (clinicians and administrative staff) via the phone, and face-to-face by care coordinators and referring Local Health District clinicians. The length of time between initial identification and enrolment differed across and within Local Health Districts and streams.
and could be up to three months. While there was little systematic monitoring of waiting times, Program staff (particularly those screening patient eligibility) were often able to do some informal triaging to ensure patients with particularly acute needs were prioritised.

- **4.3.2 Intervention**

Approaches to health coaching/self-management support

Local Health Districts differed in their approach to health coaching and self-management support.

*Telephone health coaching*

The two major approaches to telephone health coaching were:

- outsourcing to Healthways for a six month program of structured telephone coaching (three Local Health Districts); and
- developing the capacity within two Local Health Districts to provide health coaching as a new service (two Local Health Districts).

Neither of the other two rural Local Health Districts provided a telephone health coaching option.

Where telephone health coaching was provided through Healthways, reports at program completion were sent to the Local Health District and documented in clinical records. A copy was also sent to the GP. In-house telephone health coaching was undertaken by dedicated health coach positions operating from contact centres. In one site, it is anticipated that those people will also provide mentoring and supervision for other Local Health District staff to incorporate health coaching into their clinical role. Care coordinators and health support workers located in a contact centre also incorporated health coaching techniques into their ongoing telephone support role.

Two sites had a system whereby contact centre staff provided periodic follow up phone calls for patients who completed the program of structured telephone health coaching, although this was not routinely monitored. It was acknowledged that the follow up time frame could extend out given other demands on contact centre staff.

*Self-management support*

Self-management support and patient education was an integral component of existing rehabilitation programs. These varied in duration, intensity and approach within and between programs; in part due to their origins and resourcing levels. They were generally time limited, but some programs provided ongoing support. In some Local Health Districts there were efforts to ensure consistent approaches within programs across the District; whereas in other places programs operated quite independently, were of different duration and had different levels of patient contact. A number of rehabilitation staff attended health coaching training provided as part of the Program or other initiatives. The subsequent incorporation of health coaching into rehabilitation programs appeared to depend on the extent to which this was already a part of their approach.

Another approach involved the incorporation of self-management support as an integral component of clinical roles of generalist and more specialised community health clinicians, for example chronic and complex care services and care coordinators.
Approaches to comprehensively assessing needs
Two main approaches were employed, depending on the level and type of care to which patients were allocated. For clients allocated to care coordination this was usually undertaken face to face with the client and their carer over 1-2 visits, predominantly at home, but could be as part of GP appointments or even commencing during hospitalisation (more common in rural areas). The process involved care coordinators pulling together information from previous assessments, which was aided where there were shared records to which they had access, and supplementing these assessments through the administration of various assessment tools (see section 4.2.2). A similar process applied to patients allocated to receive telephone support or telephone health coaching through contact centres, although the process was usually undertaken over the telephone.

The second approach applied to patients referred to Healthways where a standalone patient self-assessment was built into the structured telephone health coaching approach, and did not involve sharing of information from previous health assessments.

Approaches to care planning and sharing information
Care coordinators developed or facilitated the development of care plans. Most Medicare Local-based care coordinators endeavoured to obtain a GPMP or work with the patient’s GP to develop one. This could be difficult to achieve where GPs were unwilling to develop or share GPMPs. In these instances or where the GPMP was not comprehensive, care coordinators developed a care plan, which outlined particularly the home care, social services and Local Health District services that they had organised and sent the GP a copy. In most places plans were shared with the Local Health District and uploaded to the community health information systems (e.g. CHIME/CERNER/FERRETT); but there were pockets within some Medicare Locals where these plans were not shared. Sites in which there were both Medicare Local and Local Health District -based care coordinators tended to use a similar approach, with the Medicare Local-based coordinators mediating between the Local Health District and GPs regarding the GPMP.

In sites where care coordinators were based solely in the Local Health District, most developed their own care plans, with variable GP input. The extent to which these plans were shared with all providers involved in the care plan depended on the capacity and use of electronic clinical information and secure messaging systems. The sharing of information with GPs was variable, with some pockets of resistance amongst Local Health District clinicians to sharing information.

Patients who received low level telephone support and follow up through contact centres had action or goal oriented plans developed that included Local Health District services. These plans were usually uploaded to CHIME/CERNER/FERRETT which facilitated information sharing amongst other Local Health District providers involved in care who could access these systems and also Medicare Local-based care coordinators. However this information was not routinely shared with GPs.

Approaches to care coordination and sharing information

Care coordination
Care coordination comprised differing levels of intensity, duration and breadth of services actively coordinated. This was mainly determined on a case by case basis by individual care coordinators in response to patient needs. It was more structured in those Local Health Districts which provided telephone follow up and support, usually monthly for 6 months; but little after that if patients were self-managing. Patients with higher level needs received a short period of intense care coordination and navigation; with a particular focus
on complex psychosocial, home care, and transport needs. Some Local Health District-based care coordinators also provided clinical care as part of their role. A major distinction was between Local Health Districts which had only Local Health District-based care coordinators and those which had Medicare Local-based positions. In the latter circumstances, ongoing care coordination was provided by GPs; whereas in the former circumstances, this was the role of the Local Health District.

The role and added value the Program for patients who were already receiving rehabilitation or case management was not always well understood or agreed. There had been considerable tension between the Program and these more specialist chronic disease related programs and services. Sites which adopted flexible approaches and ongoing collaboration to develop mutually agreed solutions were addressing concerns about the potential overlap and duplication. More successful approaches involved devolving the decision to the respective chronic disease programs and services when to enrol this cohort of eligible patients. This was generally in two situations: post discharge or where the Program care coordinators supplemented the role of specialist programs by coordinating the linkages with GPs and social care needs.

**Information sharing**

The purpose of sharing information can range from: a) sharing information with no expectation on how the information will be used, b) to influence decision-making, c) for shared decision-making.

The provision of discharge summaries to GPs and uploading GPMPs to Local Health District clinical record systems were the most widespread examples of sharing information between GPs and Local Health Districts, and the use of the information was left to individual clinicians. In a number of sites improving the timeliness and quality of discharge plans was the initial benefit perceived by GPs for participating in the Program. One site took this approach further by informing GPs of when their patients were admitted and enabling them to influence clinical decision-making, for example communicating particular medical requirements, with hospital staff. Those GP-defined benefits became the major focus of the Program’s development and role of the care coordinators in the three major hospitals and the base on which they were able to build on once they had engaged GPs.

The approach to the development and use of the GPMP affected its use as an information sharing mechanism. At one extreme obtaining the GPMP primarily to comply with MDS requirements limited its use in influencing decisions of Local Health District clinicians and was of little perceived benefit to GPs. The use of the GPMP to enable shared decision-making was most evident where Medicare Local-based care coordinators worked with the GPs and patients to develop the plans and where those plans incorporated the full range of services, whether or not the GP initiated the referral.

Developments to CHIME, ARGUS and CERNER for example facilitated information sharing amongst a broader range of clinicians. The extent to which those developments changed the ways clinicians practiced varied from a business as usual approach to a more coordinated approach where clinicians used this information to influence what they did and with whom they communicated. Two contrasting examples of a specialist team informants in a Local Health District illustrated this: one group indicated they independently developed their own plans and relied on the patients to inform them about other services they were receiving; while another team accessed information on other services as an integral part of developing their plans. Clinicians who saw the benefits of the Program were more likely to report accessing information on other providers involved in the care plan.
The lack of a more coordinated or team approach between providers working in different services and organisations may not necessarily be a problem for patients who required a low level of care coordination, where the timing of care was not on a critical care pathway, or where the care coordinators played an effective bridging role. This was most evident where there were both Medicare Local and Local Health District-based care coordinators/contact centre staff who worked effectively together to coordinate the care within and across each sector.

**Shifting between different intervention streams**

There were two areas where this occurred:

- **From rehabilitation completion to telephone health coaching.**
  Most places which offered health coaching were developing referral pathways between time limited rehabilitation programs to telephone health coaching. This commonly involved referrals at the completion of rehabilitation programs, although in at least one Local Health District, telephone health coaching was a preferred alternative to the diabetes education service for newly diagnosed people with Type Two Diabetes Mellitus. The referral process involved sending a copy of the rehabilitation goals to Healthways, but this was dependent on the particular rehabilitation program or clinician rather than a requirement.

- **From care coordination (including NBN trial) to low level telephone support.**
  In the two NBN sites, patients who completed the NBN trial were referred to the contact centre for enrolment or, if already enrolled, for ongoing telephone support and follow up as per the contact centre protocols. Sites which had articulated different levels of care coordination had processes for referring patients from higher to lower level of care. For example, in one place patients were discharged back to the contact centre from the Medicare Local-based care coordinators when they were stable, and in other sites this happened informally.

**Monitoring and follow up of individual patients**

Processes for monitoring and follow up of enrolled patients differed. At the completion of telephone health coaching through Healthways a discharge/transfer of care summary was sent to the Local Health District and uploaded to the shared clinical record. A copy was also sent to the GP and patients were advised to contact their GP if their care needs changed.

Contact centres or other Local Health District staff providing telephone support had follow up procedures while patients were active. But this follow up did not routinely extend to patients who were non-active. Several sites implemented an alert system which identified patients who re-presented to hospital and this information was conveyed to the care coordinators for their follow up. In other places, the lack of enabling ITM infrastructure was a barrier, and care coordinators relied on their informal hospital networks and their recognition of patient names from IPM and EMR reports to identify patients who were readmitted.

In the initial period of care planning and organising the services identified in the care plan, there was quite active follow up to monitor progress, but this tapered off depending on the patient’s needs and the demands of new enrolments. Beyond the system-wide initiatives referred to, the frequency and duration of monitoring and follow up was mainly left to the discretion of individual care coordinators or local arrangements. While review dates may have been recorded, these were not always occurring at the nominated time due to workload pressures.

There was no formal monitoring if services identified in the care plan were received. It was mainly left to the patient to inform the care coordinator or GP of problems they experienced in accessing services. In the
absence of patients phoning care coordinators or the contact centre to let them know of a change in their condition, the only way care coordinators became aware was when the patient re-presented to hospital.

<table>
<thead>
<tr>
<th>Key strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having a clearly delineated care coordinator role can be important for building relationships with other providers and minimise perceptions of duplication or competition.</td>
</tr>
<tr>
<td>Links with Medicare Locals through co-location/blended positions provide an opportunity for developing partnerships.</td>
</tr>
<tr>
<td>IT infrastructure provides opportunities, but these are only really capitalised on in places where there are perceived benefits of sharing information to inform/influence decision-making.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Areas for development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems for monitoring and responding to enrolment waiting times.</td>
</tr>
<tr>
<td>Ongoing (light touch) monitoring of enrolled patients who are not receiving active care coordination or health coaching.</td>
</tr>
<tr>
<td>Strengthening arrangements for GPs to refer patients who they feel could benefit from care coordination, as an alternative re-entry point to hospital re-presentation.</td>
</tr>
</tbody>
</table>
Discussion

This report describes the Program in seven Local Health Districts two years into its development. This coincided with a period of significant health reform. Implementation is considerably more advanced than what was described in the first overview in December 2011, but still far short of an integrated approach to chronic disease management. The discussion draws out some of the developments since the initial scan, and reviews some of the variations across different programs, suggesting some reasons for these. It will then review what is required for a more integrated approach to chronic disease management, and offer suggestions for how this might be supported. The discussion is structured into the following sections:

- Overview of the stage of development since the initial scan, the directions the developments are taking and the enablers which account for why things are in place or not.
- Variations in the model of care across and within LHDs, and some reasons for these
- Opportunities for future development of the Program

The discussion will refer to the following diagram, which highlights some of the main issues in which need to be addressed in a model of care for chronic disease management at a regional level.

Figure 2: The model of care and variations

This diagram shows the pathway from pre-entry, where people with chronic conditions have not yet entered the Program, through the points at which they may be identified as eligible for the Program, the process of assignment (enrolment and assessment), the different types of service/intervention which are available to
them within the Program (and the potential to move between these as required), and the process of discharge from active participation in the Program. This diagram is used in the next section to highlight developments since the initial scan of programs, and then in the final section as a framework for describing future options for developing a more comprehensive and integrated program.

5.1 Overview of developments since initial scan and the enablers

The following table and discussion summarises the focus of the Program’s development in the initial start-up stage (2010-2011), how this has developed over the 14-16 months since the initial scan in December 2011 and the enablers that have supported the changes.

Table 2: Summary of Program developments

<table>
<thead>
<tr>
<th>Area of focus</th>
<th>Initial Scan: Dec 2011</th>
<th>Case Studies: Feb-April 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems for identifying &amp; managing enrolments</td>
<td>Most focus on identifying &amp; enrolling patients from hospital presentations</td>
<td>Some well-functioning and centralised single point of contact (contact centres)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More LHDs have real time identification systems</td>
</tr>
<tr>
<td>Systems for sharing information</td>
<td>Focus on upgrading CHIME &amp; extend utilization of ARGUS</td>
<td>Improved access and functioning of CHIME and ARGUS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less utilisation for coordination by providers other than Program staff</td>
</tr>
<tr>
<td>Systems for integration with other CDM programs/services</td>
<td>Early beginnings</td>
<td>Some co-location of Aboriginal 48 hour follow up with Program staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Progress on referral pathways between rehabilitation services to Program</td>
</tr>
<tr>
<td>Model of care</td>
<td>1-2 streams developed: health coaching and care coordination Early days re implementation of health coaching stream</td>
<td>Progress on implementation of health coaching Some differentiation of levels of care coordination based on need</td>
</tr>
<tr>
<td>Program monitoring and evaluation</td>
<td>Little progress</td>
<td>Little systematic program monitoring or evaluation Some progress on embedding MDS in CHIME Some LHDs still using manual spread sheets</td>
</tr>
<tr>
<td>Focus on disadvantaged groups</td>
<td>Early days</td>
<td>Most progress in Aboriginal health Beginning focus in some LHDs on people with mental health comorbidities, rural access to rehabilitation services, self-management support for specific CALD groups</td>
</tr>
</tbody>
</table>

Entry and assignment

Centralised contact centres now operate in many Local Health Districts and are responsible for intake, referral and monitoring functions. When integrated with single point of access for all Local Health District community-based health services, this provides an efficient and sustainable infrastructure for coordinating care. However they require continuing investment. More Local Health Districts now have systems for real time identification of patients who present to hospitals. This provides the opportunity for timely follow up prior to discharge, but few Local Health Districts have systems for making this routine. The state-wide development of the Patient Flow Portal also helped those Local Health Districts with less developed systems, and particularly in rural areas, to identify patients who presented to hospitals outside their region.

The focus on disadvantaged groups has varied. Most progress has been made in Aboriginal health, particularly where referral pathways between the Program and 48 hour follow up have been established. There have also been efforts to improve access for other groups.
Co-location of Program staff with other services (e.g. hospitals, 48 hour Aboriginal follow up, with contact centres), on a temporary or more permanent basis, has fostered timely identification of patients and coordination of care.

**Options and levels of care**

Local Health Districts focussed initially on establishing the model of care and the supporting infrastructure. A number of Local Health Districts further articulated the model of care to include different levels or streams of care depending on needs. This was needed particularly where an expanded model of care and greater clarity about the level of care coordination required identified patients who could benefit from a more sustainable lower level of care.

Structured telephone health coaching was most established in those Local Health Districts where it had been outsourced.

Work is still underway in most Local Health Districts to integrate the model of care with other CDM related services and programs. Formal clinical redesign initiatives and associated supports provided by ACI have been important enablers.

Information sharing has been supported between a broader range of services and providers through developments in information systems (particularly CHIME and ARGUS), and extending access rights. This has been funded through program and the Local Health Districts. While access to information has improved, service providers other than Program staff do not appear to be using it any more frequently for coordination of care or to inform or to support decision-making.

**Integration with other chronic disease management programs**

This has mostly involved agreeing roles and referral pathways between the Program and other Local Health District programs and services, including rehabilitation programs and with 48 hour Aboriginal follow up. This is still work in progress, but the foundations have been established for this to be implemented more widely.

Establishing and maintaining effective relationships have been important for the engaging clinicians and other service providers. This has meant coming to understand their differing perspectives, and what they see as the benefits of participation. Effective communication and sustained relationships across the Local Health District, with Medicare Locals and with GPs, have been critical success factors.

A number of Local Health Districts are now beginning to use the Program as a vehicle for developing a system wide approach to chronic disease management, embedding the Program within care pathways across the continuum of care.

**What happens after active care coordination finishes**

There has been less progress since the initial scan in program monitoring and evaluation. A centralised Minimum Data Set (MDS) enables consistent data collection across the state for monitoring and evaluation purposes, but changes to the MDS and the information system upgrades it requires have limited its effectiveness to date. A number of Programs now have the capability to use their information systems to report on the MDS; whilst in other places information is still being compiled manually.
With the exception of the one site which provided telephone support, there was little systematic monitoring/follow up of patients who were no longer receiving active care coordination or health coaching. The most common approach was to react and reassess needs when patients are readmitted.

5.2 Variations in the model of care

The restructuring of NSW Health and establishment of ACI has meant that roles and responsibilities for the Program have taken some time to sort out. In the meantime, Local Health Districts have focused on developing a program that fitted their context, given their capacity, relationships and infrastructure, leading to considerable variation in approaches. The work presently being undertaken by ACI to articulate the service model and develop a self-assessment tool therefore involves a process of retrofitting established programs.

Some differences relate to geography. For example rural Local Health Districts are less complex than metropolitan Local Health Districts which span regional and rural areas, and have fewer challenges in coordinating services, especially where GPs with VMO rights at smaller rural hospitals can directly coordinate care across sectors. There was less need for a single centralised contact centre in these rural areas.

Most Programs focused on meeting their enrolment targets and so developed systems for identifying patients from hospital presentations, rather than those at risk of hospitalisation. The major variation was between those Programs which had systems for identifying patients during their hospitalisation versus at discharge. Arrangements for early identification and timely follow up of patients who represent to hospital following their enrolment varied. There were only a few places where this occurs systematically and contact is made before discharge, more commonly in rural areas and where care coordinators had easy access to, and good working relationships with, staff in hospital wards and emergency departments.

The most significant variation related to the model of care coordination and the extent to which care was coordinated across sectors. Care coordination differed in intensity, duration and breadth of services involved. Interventions ranged from a single undifferentiated model of care coordination and SMS provided to all enrolled patients to models where patients were stratified into either health coaching/self-management support or care coordination depending on their needs. There was also variation within each of these interventions, in particular between having time limited programs of structured health coaching and less structured health coaching/SMS delivered face-to-face. One site had two levels of care coordination: low level telephone support and higher level face-to-face care coordination. With the increased burden of chronic disease and therefore increased enrolment numbers, stratified approaches with differing needs based levels of care are potentially more sustainable than undifferentiated models.

As noted, these variations arose in the absence of central guidance on the model of care. While some local adaption is important, the articulation of the service model by the ACI was seen as a welcomed development.

The breadth and depth of GP engagement also varied. They were more engaged where Programs had an explicit focus on addressing needs and issues as defined by GPs, and less where the focus was more on Local Health District issues.

The location of care coordinators varied, and they contributed most to coordination of care in the sector within which they were located. Having care coordinators (or care coordination functions) based in both sectors facilitated care coordination across sectors.
The following Table summarises the implications of these differences in implementation for patients, providers and the system.

### Table 3: Components of the model of care and implications

<table>
<thead>
<tr>
<th>Components and elements of the model of care</th>
<th>Implications for patients, providers &amp; the system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENTRY</strong></td>
<td>Real time identification &amp; referrals from rehabilitation /self-management support programs facilitate continuity of care. Small number of GP referrals suggests a lack of concerted focus on meeting the care coordination needs of GPs.</td>
</tr>
<tr>
<td>• Most ED/hospital presentations - real time/ discharge (n=6)</td>
<td></td>
</tr>
<tr>
<td>• Most Hospital referrals only (n=1)</td>
<td></td>
</tr>
<tr>
<td>• Some existing Rehab/SMS program referrals as exit strategy (all)</td>
<td></td>
</tr>
<tr>
<td>• Few GP referrals (all)</td>
<td></td>
</tr>
<tr>
<td><strong>ASSIGNMENT</strong></td>
<td>Centralised &amp; integrated contact centres: greater consistency of enrolment &amp; assignment processes, scaleable &amp; can build new programs around, more sustainable system &amp; capacity for complex care, supports multidisciplinary skill mix &amp; decision-making. Decentralised contact points: dependent on individuals &amp; hence vulnerable to changes.</td>
</tr>
<tr>
<td>• Via centralised contact centre (n=5)</td>
<td></td>
</tr>
<tr>
<td>• Via de-centralised contact points (n=2)</td>
<td></td>
</tr>
<tr>
<td><strong>LEVELS OF CARE</strong></td>
<td>Varying levels of care more tailored to patient needs, more able to absorb increasing enrolment numbers.</td>
</tr>
<tr>
<td>• Low level ongoing telephone support (n=1)</td>
<td>Low level ongoing telephone support provides opportunity to escalate care before hospital presentation.</td>
</tr>
<tr>
<td>• Health coaching/SMS (n=1)</td>
<td>Undifferentiated level of care coordination – less capacity to absorb increasing numbers.</td>
</tr>
<tr>
<td>• Structured telephone health coaching (n=4)</td>
<td></td>
</tr>
<tr>
<td>• Undifferentiated care coordination/SMS (n=2)</td>
<td></td>
</tr>
<tr>
<td>• Care coordination (all)</td>
<td></td>
</tr>
<tr>
<td><strong>LOCATION OF CARE COORDINATION</strong></td>
<td>Location of care coordinators particularly assists with care coordination in each sector (i.e. across the LHD or across the primary care sector)</td>
</tr>
<tr>
<td>• LHD-based (n=2)</td>
<td></td>
</tr>
<tr>
<td>• ML-based (n=4)</td>
<td></td>
</tr>
<tr>
<td>• Both LHD &amp; ML-based (n=1)</td>
<td></td>
</tr>
<tr>
<td><strong>SHIFTING BETWEEN LEVELS OF CARE</strong></td>
<td>Opportunity to shift between levels of care facilitates smooth transitions in response to changing needs.</td>
</tr>
<tr>
<td>• Care Coordination to low level telephone support (n=1)</td>
<td>Lack of smooth transition between telephone health coaching &amp; care coordination if needs change can disrupt continuity of care</td>
</tr>
<tr>
<td>• Rehabilitation to telephone health coaching (n=4)</td>
<td>Transition from rehabilitation &amp; telephone health coaching provides somewhere for clinicians to refer patients who could benefit from additional support.</td>
</tr>
<tr>
<td>• No systematic approach (n=2)</td>
<td>Opportunity for contact centres to take on this coordination function</td>
</tr>
<tr>
<td><strong>COORDINATION BETWEEN SECTORS</strong></td>
<td>Contact centres are the link to support coordination between sectors</td>
</tr>
<tr>
<td>• Contact centres &amp; ML-based CC (n=4)</td>
<td>All bar one LHD have structures to support coordination between sectors</td>
</tr>
<tr>
<td>• LHD &amp; ML-based CC (n=2)</td>
<td></td>
</tr>
<tr>
<td>• None (n=1)</td>
<td></td>
</tr>
<tr>
<td><strong>MONITORING/EXIT/RE-ENTRY</strong></td>
<td>Only one model (low level on-going telephone support) can flag early identification of problems. Following after active health coaching/care coordination, most models rely on either patient self-management or GPs for ongoing monitoring. To date, there has been little explicit focus on GP referrals for patients they are concerned about.</td>
</tr>
<tr>
<td>• Flagged for hospital re-presentation (all)</td>
<td></td>
</tr>
<tr>
<td>• Ongoing low level telephone support (n=1)</td>
<td></td>
</tr>
<tr>
<td>• No system-wide approach to monitoring post active care coordination (n=6)</td>
<td></td>
</tr>
</tbody>
</table>
5.3 Opportunities for development

On one level, the Program is an individually focused intervention providing care coordination or health coaching/self-management support for patients who met particular eligibility criteria. However this also requires strengthening the chronic disease management system as whole, as this is re-designed to meet the demands of the Program. It also begins to change from a purely individual program to a population approach to chronic disease management, as efforts are made to extend it to all who could benefit.

This evolution depends upon a number of developments. These build on the original work of the Local Health Districts in setting up the most basic arrangements for the Program: identifying eligible people, enrolling them, and providing some kind of care coordination or health coaching/self-management support.

One development involves extending the entry points to the program. The more points of access, the less likely people will be missed. In most places hospitals were the initial entry point. In some places this has now been extended to other services – rehabilitation services, and to a lesser extent, general practice for example. There is scope for extending this further, in the spirit of the ‘no wrong door’ approach, where access to a service does not depend on where a person presents. However services are only likely to take part if the Program helps solve their problems in managing complex chronic care, as well as benefiting patients. Thus a GP will be much more likely to use a service that accepts all his/her referrals (as the Veterans Coordinated Care program does) than one which rejects some as not meeting entry criteria. A rehabilitation service may be more likely to refer when they see the Program as a useful discharge route for their patients rather than a competitor. The aim here is to extend the Program’s reach by integrating it more closely into the working of other chronic disease related services.

A second relates to extending the range of interventions available. This includes extending the options based on risk stratification (different level of health coaching, care coordination and related interventions), and setting up pathways for people to shift from one option to another as their needs change – currently not available in all Programs. The interventions can then be linked with other service options so that the coaching and care coordination are more integrated with the person’s overall care. This might be within the Local Health District - for example with rehabilitation programs – or outside, for example through Medicare Locals, or Aboriginal Health services. Health Pathways provides one way of creating links between the Program stream of service delivery and other streams of care. The aim of this is to have a more comprehensive and flexible set of options available to people who are enrolled within the Program, and care coordination more available to those in other streams who are eligible.

A third relates to ongoing follow up after completion of active care, which is often not managed with any clarity. People who cease to receive active care coordination or health coaching are very likely to need focused care again in the not too distant future. Discharge to GP care without any ongoing contact with the Program or specific arrangements for re-engagement in the Program is likely to leave people adrift when they most need care. Arrangements for low level ongoing connection or advanced access to services when needed will help maintain support for this vulnerable group of people.

This relates to the issue of re-entry. There is no systematic approach whereby people discharged from active care can be re-engaged as required before they re-present to hospital. Improved flagging and recognition of people who have been in the Program and arrangements for accelerated access on self referral or from general practice would make it possible for people to cycle in and out of active involvement in the Program as required. The aim here is continuity of care and easy re-entry to care coordination.
Taken together, these developments represent a move towards:

- Better coordination of care, within the Program’s services and with other service streams
- Better integration of service provision, with the Program more clearly linked to general practice, rehabilitation and other services
- Better continuity of care, with easier and more timely re-entry to care coordination for people who have been involved in the Program
- Better reach, using extra entry points to offer care coordination and health coaching to a wider range of people
- Better monitoring: the diagram in figure 2 can be used to monitor the flow of people into the Program, through the different service options, out into ongoing care and back into the Program as needed.

5.3.1 Summary suggestions for the Program

State-wide Program

10. Define and communicate the primary focus of the Program. Is it primarily for patients of the NSW health system (with some assistance from other services), OR, as a program for the population as a whole, is it also primarily for the patients of GPs? Determining the primary focus will help clarify the role of different services in the Program, and so the extent to which it needs to be designed to meet their needs as providers of chronic care. This will then need to be clearly communicated to all stakeholders and to inform future redesign and Program development at state and local levels.

11. Use the development of the service model to articulate a wider range of streams of care: for example different levels and intensity of health coaching, self-management support and care coordination. A more varied approach can better meet the changing needs of individual patients (providing that there are paths for moving between different levels), and help cope with increasing levels of enrolment and limited resources.

12. Improve coordination between the public (i.e. Local Health District) and private (i.e. primary care) sectors. Focusing the effort and investment in one sector only risks of increasing fragmentation between sectors, even though coordination may be enhanced within one sector. Examples of effective strategies include: multi-sector management of the program as a whole; strong linkages between contact centre Program staff and Medicare Local-based care coordinators; funding both Medicare Local and Local Health District-based care coordinators where there is no contact centre infrastructure able to take on this role; and modelling a partnership approach in all Program promotion and communication strategies.

13. Use the state-wide development of EMR systems as an opportunity to develop better systems for identifying and following up enrolled patients who represent to hospital, before they are discharged.

Local Programs

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113 Cf Leutz (1999) terms the third law of integration: “your integration is my fragmentation.”
14. Develop care pathways to better integrate the different elements of the Program and to link the program with other chronic disease management services. These can also support timely identification and referral of patients, reactivation for patients who may need further support before they present to hospital; and enable patients to shift between levels of care as their needs change.

15. When improving information and communication systems, include change management programs to encourage clinicians to use the shared clinical information to support patient care.

16. Improve systems for identifying and following up patients who re-present to hospital, prior to their discharge.

17. Improve systems and protocols for ongoing follow-up of ‘non-active’ clients, and monitoring adherence to care.

18. Develop systems for routine monitoring and review of care received by enrolled patients, including waiting times between enrolment and assessment; and waiting times for and/or gaps in services.
## Appendix: Case study site selection criteria

The following table identifies the criteria for selecting the case studies and the rating scale. These have been developed in consultation with evaluation consortia team, the ACI, the Ministry of Health and GPNSW.

Each LHD evaluation contact person was asked to rate their program against each criteria. The evaluation consortia team, ACI, the Ministry of Health and GPNSW were also asked to rate each LHD against the criteria. The results informed the selection of the case study sites. The case studies include a mix of urban and rural LHD and include programs which are doing well and which are doing things in different ways. For example: centralised or decentralised decision-making and implementation; differences ML involvement in governance and decision-making, including location responsibility of care coordinators; differences in integration with other CDM programs; and differences in the health coaching models.

The criteria include the seven major functions of the NSW CDMP and the desired outcomes within each of these functional areas. This focus on outcomes recognises that there will be variability in the ways of achieving these outcomes, including the systems and processes.

The ‘whole or parts of’ the LHD refers to both all or parts of the geographical area, as well as the involvement of all or parts of chronic disease specialist services/programs; community health services, and/or other chronic disease management programs/services.

<table>
<thead>
<tr>
<th>The LHD (whole or parts of) has made progress regarding the development and implementation of the following:</th>
<th>Which LHDs should be considered to include in the case studies &amp; why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification and enrolment</td>
<td>Name of LHD:</td>
</tr>
<tr>
<td>• Patients are identified via a range of settings</td>
<td>Rationale for inclusion (ie major contributing factor to this rating)</td>
</tr>
<tr>
<td>• Appropriate patients are identified (meet the enrolment criteria)</td>
<td></td>
</tr>
<tr>
<td>• Sufficient numbers of patients are enrolled (based on targets)</td>
<td></td>
</tr>
<tr>
<td>• Patients enrolled reflect local population need (equity)</td>
<td></td>
</tr>
<tr>
<td>• Processes for identification, initial assessment &amp; enrolment work smoothly for patients &amp; providers</td>
<td></td>
</tr>
<tr>
<td>Care coordination</td>
<td>Name of LHD:</td>
</tr>
<tr>
<td>• Care coordination is available to all enrolled patients who need it</td>
<td>Rationale for inclusion (ie major contributing factor to this rating)</td>
</tr>
<tr>
<td>• Care coordination covers co-morbidities &amp; takes account of psycho-social issues</td>
<td></td>
</tr>
<tr>
<td>• The care coordination role is experienced as sustainable &amp; fulfilling</td>
<td></td>
</tr>
<tr>
<td>• Processes for care coordination work smoothly for patients &amp; providers</td>
<td></td>
</tr>
<tr>
<td>Shared care and management</td>
<td>Name of LHD:</td>
</tr>
<tr>
<td>• Processes for comprehensive needs assessment, care planning and ongoing management work smoothly for patients and providers</td>
<td>Rationale for inclusion (ie major contributing factor to this rating)</td>
</tr>
<tr>
<td>• Patients enrolled receive the care they need &amp; in a timely fashion</td>
<td></td>
</tr>
<tr>
<td>Health coaching</td>
<td>Name of LHD:</td>
</tr>
<tr>
<td>• Health coaching is available to enrolled patients who meet the criteria</td>
<td>Rationale for inclusion (ie major contributing factor to this rating)</td>
</tr>
<tr>
<td>• Patients shift between health coaching and care coordination as required</td>
<td></td>
</tr>
<tr>
<td>• Information is shared between health coaching &amp; other aspects of chronic care</td>
<td></td>
</tr>
<tr>
<td>Monitoring and review/evaluation (local and contribution to state-wide purposes)</td>
<td>Name of LHD:</td>
</tr>
</tbody>
</table>
## The LHD (whole or parts of) has made progress regarding the development and implementation of the following:

<table>
<thead>
<tr>
<th>Operations &amp; outcomes of the program are regularly monitored, including:</th>
<th>Which LHDs should be considered to include in the case studies &amp; why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- systems &amp; processes</td>
<td>Rationale for inclusion (i.e. major contributing factor to this rating)</td>
</tr>
<tr>
<td>- equity &amp; reach across populations &amp; services</td>
<td></td>
</tr>
<tr>
<td>- satisfaction of patients &amp; providers</td>
<td></td>
</tr>
<tr>
<td>Results are used to improve the program</td>
<td></td>
</tr>
</tbody>
</table>

## Integrated program management across services & sectors (i.e. LHD & general practice)

- Program & clinical governance systems include representation from all relevant services/sectors & health professional/practitioner groups
- Program & clinical governance systems take a whole of health system perspective as well as a service/sector specific perspective
- Management of the program is linked to the management of other chronic care initiatives.

| Name of LHD: | Rationale for inclusion (i.e. major contributing factor to this rating) |

## Community engagement

- The needs and perspectives of the community are identified & inform the ongoing development of the program
- The community participates in decision-making about the program

| Name of LHD: | Rationale for inclusion (i.e. major contributing factor to this rating) |

## Rating scale

Which best describes the stage of achievement of each major function (i.e. the achievement of the function as a whole, not the achievement of individual outcomes within each function)?

1. Achieved broadly across LHD & with general practice
2. Achieved broadly across LHD, but in patches in general practice
3. Patchy achievement across the LHD & in general practice
4. In development/pilot phase

**NOTE:** across the LHD includes (a) the geographical spread of the program, and (b) involving chronic disease specialist programs/services, community health services and other chronic disease management programs/services.
5.2 Survey tools used in final scan

5.2.1 LHD survey tool

Evaluation of the NSW Chronic Disease Management Program - Local Health District Survey

You are invited to take part in the evaluation of the NSW Chronic Disease Management Program – Connecting Care in the Community (NSW CDMPP) that is being undertaken between 2012–2014. This evaluation is being carried out by The George Institute for Global Health, in partnership with the Centre for Primary Health Care and Equity (CPHCE), UNSW.

The overall aim of the evaluation is to measure the impact, reach, equity and costs of the Program. As part of this evaluation, the CPHCE is undertaking the process evaluation component. Process evaluation aims to describe how the Program has been implemented in Local Health District and Medicare Locals; 2) describe key staff views of the factors that have influenced their Program; 3) describe staff satisfaction with their Program and their roles in it; 4) identify differences in reach, effectiveness, costs or benefits, patient or provider satisfaction, including any variations from the prescribed NSW CDMPP; and 5) derive lessons which may be relevant to similar programs or initiatives.

What will happen in the process evaluation?

The process evaluation comprises an initial high level scan of all 15 LHD Programs (Dec 2010-Jan 2011); in-depth case studies of 7 LHD Programs (Jan-April 2013); and a final high level scan of all 15 LHD Programs (April-May 2014). The stages of evaluation involve participating in an online survey. All Local Health Districts and Medicare Locals have been invited to take part and have been asked to select the person(s) best able to answer the questions to complete the survey.

Online survey

The survey should take approximately an hour to complete. You may at any stage save the uncompleted survey and return to it later. If you require assistance you can contact Julie McDonald: ph: 03 8365 6412 or 0400 760 226, or email: j.mcdonald@unsw.edu.au

If you decide to participate you will be asked a series of questions about the implementation of the Program in your Local Health District. In the survey we are focusing on identifying and describing the Program and models that are being implemented, and the elements that make up the model of care and the supporting service and governance level components.

Follow up telephone interview

A short follow up telephone interview will be held with participants. This interview will clarify any of your responses and also explore your experiences of, and satisfaction with, the Program. The interview will be done shortly after the online survey has been completed at a time that is convenient to you and you can choose to be interviewed alone or with other staff involved in the Program. The interview will take between 20-30 minutes. The interview will be conducted by one of the CPHCE Team and audio-taped using a digital recorder. The interview will not be transcribed, but will be used as prompts in summarising the interview after which the audio-tape will be destroyed.

Is participation voluntary?

Your decision whether or not to participate will not jeopardise your relationship with the health service in which you work, other health services with whom you work, the NSW Ministry of Health, Agency for Clinical Innovation, the University of New South Wales or The George Institute for Global Health. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice by filling out the revocation of consent form that was sent to you along with other information about this survey, or by obtaining a copy from the researchers. A copy of this form has been sent to you for you to keep.

Who is on the process evaluation team?

The process evaluation will be conducted by A/Prof Gawaine Powell Davies, Dr Julie McDonald and others from the CPHCE at UNSW.

How will the information be used?
The information you provide will be analysed and reported as part of the final evaluation report. Any information that is obtained in connection with this survey and that can be identified with you or your Local Health District will remain confidential and will be disclosed only with your permission, except as required by law. If you give us your permission by answering ‘Yes’ to Question 1, we plan to include the results in a report to the NSW Ministry of Health, and may seek permission from the Ministry to publish papers on the evaluation. In any publication, information will be provided in such a way that you or your Local Health District cannot be identified.

How will your privacy be protected?
No individuals or individual Local Health Districts will be identified in any reporting of findings. All information collected from you will be stored in password-protected databases, and locked filing cabinets and will be disclosed only with your consent or except as required by law.

Risks and benefits
We are not aware of any risk to your or your Local Health District in taking part in the process evaluation. Likely benefits are from the final evaluation report and associated dissemination activities which may assist in the ongoing program development and implementation in your Local Health District.

Further information
If you would like more information before you decide, please contact Dr Julie McDonald, Tel 02 8365 6123. This research has been approved by the NSW Population & Health Services Research Ethics Committee HREC/11/CIPHS/69. Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Ethics Coordinator, Cancer Institute NSW, ph 02 8374 5600.
I consent to take part in the process evaluation by volunteering to participate in an on-line survey and follow up telephone interview.

- Yes - please continue on
- No - please log out

**INSTRUCTIONS:**
Please refer to email sent to you which includes instructions for completing this On-Line Survey

**DEMOGRAPHIC DATA**

1. Please select your Local Health District name
   - Central Coast
   - Far West
   - Hunter New England
   - Illawarra Shoalhaven
   - Mid North Coast
   - Murrumbidgee
   - Nepean Blue Mountains
   - Northern NSW
   - Northern Sydney
   - South Eastern Sydney
   - South West Sydney
   - Southern NSW
   - Sydney
   - Western NSW
   - Western Sydney
2. Contact Person

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact phone number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Email address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

3. How long have you been the program manager/equivalent for the NSW CDMP?

- [ ] Over 3 years
- [ ] 2-3 years
- [ ] 1-2 years
- [ ] 6 months - 1 year
- [ ] Less than 6 months

**CONTEXT**

4. Looking back over your Program (i.e. the NSW CDMP), what factors have had a significant influence on how the Program has developed in your Local Health District?

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

**MODEL OF CARE**

We would like to know about the model of care you have developed and are implementing. We are interested in knowing what aspects are currently in place (i.e. the last 3 months).

The following questions cover the major domains and key elements that relate to the model of care.

Page 3 of 22
### INITIAL IDENTIFICATION AND ENROLLMENT

**5.** Please estimate the proportions of patients currently being enrolled that are identified/referred from each of the following sources (the total should add up to about 100%).

<table>
<thead>
<tr>
<th>Source</th>
<th>&gt; 75% of patients</th>
<th>50-75% of patients</th>
<th>25-50% of patients</th>
<th>6-25% of patients</th>
<th>0-5% of patients</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals in LHD (inpatients or ED presentations)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Patient flow portal (includes all hospitals in NSW)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Chronic disease rehabilitation programs</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Other LHD service programs</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>General practices</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Aboriginal community controlled health services/Aboriginal Medical Services</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Other LHD or community-based services (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Other LHD or community-based services (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**6.** Please list other LHD and/or community-based services for 1 & 2 above.

- ...
- ...
- ...
- ...

**7.** Please estimate the proportion of eligible patients from Aboriginal/Torres Strait Islander backgrounds that are currently being identified/referred as part of the 48 hr Follow Up Initiative.

<table>
<thead>
<tr>
<th>Proportion of Indigenous Patients</th>
<th>&gt;75% of Indigenous Patients</th>
<th>50-75% of Indigenous Patients</th>
<th>25-50% of Indigenous Patients</th>
<th>6-25% of Indigenous Patients</th>
<th>0-5% of Indigenous Patients</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**8.** Are any tools used to support enrolment decisions?

- ○ Yes
- ○ No

If Yes, please list. If No go to Question 10.

- ...
9. Which of the following decisions do the decision support tools identified in Q. 8 support?

- Eligibility for enrolment in the Program
- Allocation to level of care for enrolled patients
- Priority to be seen once enrolled

Other decisions (please list)

10. Please estimate the proportion of enrolled patients currently included on the Minimum Data Set submitted to the NSW Ministry of Health?

- >75% of patients
- 50-75% of patients
- 25-50% of patients
- 0-25% of patients
- 0-5% of patients
- Don't know

11. Other comments about identification and enrolment or issues to follow up in the interview (optional).

..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................

COMPREHENSIVE ASSESSMENT FOR PATIENTS ENROLLED IN THE NSW CDMP
12. Which best describes the current approach to comprehensive assessments for patients enrolled in the NSW CDMP?

- A single comprehensive assessment is undertaken or compiled for all or most patients
- Multiple comprehensive assessments for all/most patients with some standards or common elements with variations decided by provider/service
- Multiple comprehensive assessments for all/most patients which vary according to provider/service without standards or common elements

Other (please specify)

13. Please estimate the proportion of comprehensive assessments that is undertaken or compiled by each of the following groups for patients enrolled in the NSW CDMP. (The total should add up to about 100%)

<table>
<thead>
<tr>
<th>Group</th>
<th>&gt;75%</th>
<th>50-75%</th>
<th>25-&lt;50%</th>
<th>6-&lt;25%</th>
<th>0-5%</th>
<th>Don't know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHID-based care coordinators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ML based care coordinators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other LHID-based clinicians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General practice staff</td>
<td></td>
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<tr>
<td>Other groups (please list below)</td>
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</table>

14. Please list any other groups providing comprehensive assessments and estimate the proportion of assessments they undertake/compile.

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15. Other comments about comprehensive health assessments for patients enrolled in the NSW CDMP, or issues to follow up in the interview (optional).

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CARE PLANNING FOR PATIENTS ENROLLED IN THE NSW CDMP

16. Please estimate the proportion of CDMP care plans developed by each of the following groups for patients allocated to care coordination/case management. (The total should add up to about 100%)

<table>
<thead>
<tr>
<th></th>
<th>&gt; 75% of patients</th>
<th>50-75% of patients</th>
<th>25-&lt;50% of patients</th>
<th>6-&lt;25% of patients</th>
<th>0-5% of patients</th>
<th>Don't know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHD-based care coordinators</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>ML-based care coordinators</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Other LHD directors</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>GP/practice nurses</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Other groups</td>
<td>○</td>
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</table>

17. Please list other groups

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18. Please estimate how many clinicians within each of the following groups who are involved in the care of patients in the NSW CDMP can access the care coordination plan (where they have not developed the care plan themselves).

<table>
<thead>
<tr>
<th></th>
<th>All/most</th>
<th>Some</th>
<th>None</th>
<th>Don't know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHD community health staff (e.g. community nurses, allied health, Aboriginal health workers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>LHD chronic disease programs/services (e.g. rehabilitation programs, chronic &amp; complex care, specialist chronic disease)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>General practice (e.g. GPs, practice nurses)</td>
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<tr>
<td>ASET</td>
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<tr>
<td>Other LHD aged care services</td>
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<tr>
<td>Other services (1), please list below</td>
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<tr>
<td>Other services (2), please list below</td>
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</table>

19. Please list any other services.

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20. Overall, how consistently do you think each of the following group accesses the CDMP care coordination plan to inform their care?

<table>
<thead>
<tr>
<th></th>
<th>Always/mostly</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
<th>Don't know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHD community health staff (e.g. community nurses, allied health, Aboriginal health workers, etc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LHD chronic disease programs/services (e.g. rehabilitation programs, chronic &amp; complex care, specialist chronic disease, etc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Practice (GP/practice nurses)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASET</td>
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<td></td>
<td></td>
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<tr>
<td>Other LHD aged care services</td>
<td></td>
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<td></td>
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<tr>
<td>Other services (1), please list below</td>
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<tr>
<td>Other services (2), please list below</td>
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</table>
21. Comments about care planning for patients enrolled in the NSW CDMP, or issues to follow up in the interview (optional).

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LEVELS OF CARE

22. Is there more than one level of care (as defined in Q. 23 below) that is currently implemented?

☐ Yes
☐ No

If No, go to Question 25

23. Please estimate the proportion of enrolled patients who are currently receiving each of the following levels of care. (The total should add up to about 100%)

<table>
<thead>
<tr>
<th>Level of Care</th>
<th>&gt; 75% of patients</th>
<th>50-75% of patients</th>
<th>25-&lt;50% of patients</th>
<th>6-&lt;25% of patients</th>
<th>0-5% of patients</th>
<th>Don't know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Telephone support only (e.g. care navigation, SMS)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>B. Telephone support &amp; occasional face to face care (e.g. care navigation, SMS, clinical care)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>C. More regular face to face care, with or without telephone support</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>D. As C plus intensive case management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>E. Time limited care (e.g. rehabilitation program)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>F. Other level of care (1), list below</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>G. Other level of care (2), list below</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</table>

24. Please list other levels of care.

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25. Please estimate the proportion of patients enrolled in the NSW CDMP for whom each of the following groups coordinates the implementation of the care plan. (The total should add up to about 100%)

<table>
<thead>
<tr>
<th></th>
<th>&gt; 75% of patients</th>
<th>50-75% of patients</th>
<th>25-&lt;50% of patients</th>
<th>6-&lt;25% of patients</th>
<th>0-5% of patients</th>
<th>Don't know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHD-based NSW CDMP care coordinator</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>ML-based NSW CDMP care coordinator</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>LHD chronic disease programs/services</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>LHD aged care service</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Other LHD-based clinicians/services</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
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<td>☐</td>
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<tr>
<td>Other ML-based care coordinators (e.g. Specialist)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>GP/FN</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Other groups (1), please list below</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other groups (2), please list below</td>
<td>☐</td>
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<td>☐</td>
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</table>

26. Please list any other clinicians/services.

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27. Other comments about the level of care provided for patients enrolled in the NSW CDMP, or issues to follow up in an interview (optional).

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HEALTH COACHING
28. Please estimate the proportion of staff currently employed in each of the following groups who has received formal training in health coaching since the Program began (not necessarily provided through the NSW CDMP).

<table>
<thead>
<tr>
<th></th>
<th>&gt;75% of staff</th>
<th>50-&lt;75% of staff</th>
<th>25-&lt;50% of staff</th>
<th>6-&lt;25% of staff</th>
<th>0-5% of staff</th>
<th>Don't know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW CDMP-funded care coordinators (LHD-based)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>NSW CDMP-funded care coordinators (ML-based)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Community health staff (LHD) working with patients enrolled in the NSW CDMP</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other LHD staff working with patients enrolled in the NSW CDMP</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Practice nurses working with patients enrolled in the NSW CDMP</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Other groups working with patients enrolled in the NSW CDMP (1), please list below</td>
<td>☐</td>
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<td>☐</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other groups working with patients enrolled in the NSW CDMP (2), please list below</td>
<td>☐</td>
<td>☐</td>
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29. Please list any other groups.

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30. Other comments about training in health coaching, or issues to follow up in the interview (optional).

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The following two questions relate to:
Telephone health coaching (provided through Healthways, Get Healthy, private health insurance companies or an equivalent LHD-based program);
Time limited LHD rehabilitation programs.
31. Please estimate the proportion of ALL health coaching that is provided by each of the following groups to patients enrolled in the NSW CDMP.

<table>
<thead>
<tr>
<th></th>
<th>&gt;75% of health coaching</th>
<th>50-75% of health coaching</th>
<th>25-&lt;50% of health coaching</th>
<th>6-&lt;25% of health coaching</th>
<th>&lt;5% of health coaching</th>
<th>Don’t know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthways</td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>Get Healthy</td>
<td>☐</td>
<td></td>
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<td></td>
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<td>☐</td>
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<tr>
<td>Private health insurer (e.g. HCF)</td>
<td>☐</td>
<td></td>
<td></td>
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<td></td>
<td>☐</td>
</tr>
<tr>
<td>LHD telephone health coaching program</td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>Time-limited LHD rehabilitation programs</td>
<td>☐</td>
<td></td>
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32. Comments about health coaching, or issues to follow up in the telephone interview (optional).

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CLINICAL PATHWAYS

33. Please list areas where clinical pathways have been developed/modified to include referral to the NSW CDMP.

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34. Comments about clinical pathways, or issues to follow up in the telephone interview (optional).

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37. Please specify any other arrangements to support clients accessing social care services not mentioned above.

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38. Comments about social care services, or issues to follow up in an interview (optional).

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PROGRAM INFRASTRUCTURE

The following questions relate to the supporting infrastructure for the Program.

OVERALL GOVERNANCE

39. Which best describes the overall governance structure for the CDMP?

- Integrated (i.e. with other relevant chronic disease governance structures)
- Standalone/separate governance structure (i.e. for the CDMP only)
- No functioning overall governance structure

Other (specify) ........................................................................................................

If no functioning governance structure, please go to Question 42
40. Which of the following groups are currently represented in the governance structure?

- LHD executive
- NSW CDMP Program Manager/equivalent
- LHD hospitals (e.g. representing hospital presentations/admissions/discharge services)
- Community health services (LHD)
- Chronic condition specialist services (LHD)
- Aged care services (LHD)
- Aboriginal health services (LHD)
- Medicare Locals
- General Practice
- Aboriginal Community Controlled Health Services/AMS
- Consumers
- Other (specify)

41. Which of the following clinician groups are represented in the overall governance structure?

- GPs
- Medical specialists
- Community health nurses
- Chronic disease specialised nurses
- Allied health professionals
- Aboriginal health workers
- Other (specify)

42. If the clinician groups identified in Q. 41 are not represented in the governance structure, describe how, if at all, they can influence decision-making about the NSW CDMP.
43. Other comments on the overall governance arrangements for the Program, or issues to follow up in an interview (optional).

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CLINICAL GOVERNANCE AND QUALITY

44. Are there clear clinical governance arrangements for the work of the NSW CDMP care coordinators?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>To some extent</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>L&amp;D-based</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ML-based</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</table>

45. Briefly describe the most significant quality improvement activity undertaken over the last 6 months and what aspect of the Program was its focus.

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46. Other comments on the clinical governance or quality of the Program, or issues to follow up in an interview (optional).

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NSW CDMP CARE COORDINATORS
47. Please indicate the location of NSW CDMP-funded care coordinators.

- [ ] LHD-based
- [ ] ML-based
- [ ] Other (please specify)

48. If there are LHD-based care coordinators, please estimate what proportion of their time is spent on each of the following tasks. (The total should add up to about 100%).

<table>
<thead>
<tr>
<th>Task</th>
<th>&gt;75% of time</th>
<th>50-75% of time</th>
<th>25-50% of time</th>
<th>0-25% of time</th>
<th>0-5% of time</th>
<th>Don't know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linking with GPs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Linking with ACCs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Supporting LHD clinicians</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Supporting general practitioners</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Supporting patients to navigate their care and self-management</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Health coaching</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Providing clinical care</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Providing telephone support</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Organising and facilitating referrals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other tasks (1), specify below</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other tasks (2), specify below</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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</table>

49. Please specify other tasks.

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50. If there are Medicare Local-based care coordinators, please estimate the proportion of their time currently spent on each of the following tasks.

<table>
<thead>
<tr>
<th>Task</th>
<th>&gt;75% of time</th>
<th>50-75% of time</th>
<th>25-50% of time</th>
<th>6&lt;25% of time</th>
<th>0-5% of time</th>
<th>Don't know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liaising with GPs</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Liaising with ACHS</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Supporting LHD clinicians</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Supporting general practices</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Supporting patients to navigate their care and self-management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Structured health coaching</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Providing clinical care</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Providing telephone support</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Organising and facilitating referrals</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other tasks (1), please specify below</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Other tasks (2), please specify below</td>
<td>☐</td>
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</table>

51. Please specify other tasks.

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52. Other comments on the NSW CDMP Coordinators, or issues to follow up in an interview (optional).

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SYSTEMS FOR INFORMATION SHARING
53. Are there systems for electronic sharing of information (including shared electronic patient records) about patients enrolled in the NSW CDMP?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>In part</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Across the LHD</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Between the LHD and general practices</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Between the LHD and ML</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Between the LHD and ACCHS</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Between the LHD and other outside agencies (e.g. Healthways)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

54. If answered Yes/In Part to Q. 53, please nominate the groups who can access these systems.

<table>
<thead>
<tr>
<th></th>
<th>All/ most</th>
<th>Some</th>
<th>A few</th>
<th>None</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHD services</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>General Practices</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medicare Local</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ACCHS</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other outside agencies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

55. How adequately is the NSW CDMP currently supported by local clinical information systems (e.g. CHIME/CERNER)?

- Fully supported
- Partly supported
- Not supported at all

56. Other comments on systems for sharing information, or issues to follow up in an interview (optional).

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INTAKE CENTRES/POINTS FOR PATIENTS IN THE NSW CDMP
57. Which best describes the current intake arrangements for your Program?

- A single intake centre/point using a consistent approach for patients in the Program
- Multiple intake centres/points using a consistent approach for patients in the Program.
- Multiple intake centres/points NOT using a consistent approach for patients in the Program.
- No identified intake centre/ contact point/s

Other (please specify) ..............................................................................................................................................................

<table>
<thead>
<tr>
<th>58. If there is an intake centre/s, please indicate if they have a role in each of the following:</th>
<th>Yes</th>
<th>To some extent</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying and registering eligible patients</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Enrolling patients</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Facilitating referrals associated with the CDMP care plan</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Notifying the designated care coordinator if patients present to eD OR hospital</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Central point of contact for patients</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

59. If you currently have an intake centre/s for patients in the Program, to what extent are they currently integrated with the intake arrangements for the following services?

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Fully integrated</th>
<th>Partly integrated</th>
<th>Not integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal 48 hour follow up (LHO)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Community health services (LHO)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Aged care services (LHO)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other (please specify below)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tbody>
</table>

60. Please specify any other services.

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61. Please estimate the proportion of enrolled patients who are given a telephone number for contacting the Program in case of need?

<table>
<thead>
<tr>
<th>Proportion</th>
<th>&gt; 75% of patients</th>
<th>50-75% of patients</th>
<th>25-50% of patients</th>
<th>6-25% of patients</th>
<th>0-5% of patients</th>
<th>Don't know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

62. Comments on intake arrangements for the Program, or issues to follow up in an interview (optional)

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SYSTEMATIC MONITORING OF THE NSW CDMP

63. Is there a system (i.e. an organised approach) for monitoring the progress of enrolled patients ACROSS the Program?

- Yes
- No
- In part
- Under development

64. Are you monitoring the REACH of the program (i.e. the percentage of eligible patients who are offered enrolment in the NSW CDMP)?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>To some extent</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amongst eligible</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>patients of the LHD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amongst the eligible</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>population in the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LHD catchment area</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

65. Comments on systems for monitoring of the NSW CDMP, or issues to follow up in an interview (optional).

.................................................................................................................................
.................................................................................................................................
.................................................................................................................................
.................................................................................................................................
.................................................................................................................................
66. What else do we need to know about how your Program is structured or managed in order to understand your responses to this survey?

67. Other final comments

Thank you for responding to this survey.
5.2.2 ML survey tool

Evaluation of the NSW Chronic Disease Management Program: Medicare Local Survey

You are invited to take part in the final part of the evaluation of the NSW Chronic Disease Management Program – Connecting Care in the Community (NSW CDMP). The evaluation has been running since 2011 and is being carried out by The George Institute for Global Health, in partnership with the Centre for Primary Health Care and Equity (CPHCE), UNSW.

The overall aim of the evaluation is to measure the impact, reach, equity and costs of the Program. As part of this evaluation, the CPHCE is undertaking the process evaluation component.

The process evaluation aims to: 1) describe how the Program has been implemented in Local Health Districts and Medicare Locals; 2) describe key staff views of the factors that have influenced their Program; 3) describe staff satisfaction with their Program and their roles in it; 4) identify differences in the way the Program has been implemented which may explain differences in reach, effectiveness, costs or benefits, patient or provider satisfaction, including any variations from the prescribed Program; and 5) derive lessons which may be relevant to similar programs or initiatives.

What happens in the process evaluation?
The process evaluation to date has comprised an initial high level scan of all 15 LHD Programs, in late 2010-early 2011, and in-depth case studies of 7 LHD Programs, which occurred between Jan-April 2013.

The final part of the process evaluation is a high level scan of all 15 LHD Programs (April-May 2014). This involves participating in an online survey. All Local Health Districts and Medicare Locals have been invited to take part and have been asked to select the person's best able to answer the questions to complete the survey.

On-line survey
The survey should take approximately 20-30 minutes to complete. You may at any stage leave the uncompleted survey and return to it later. If you require assistance you can contact Julie McDonald: ph: 9385 8412 or 0409 760 225, or email: j.mcdonald@unsw.edu.au

If you decide to participate you will be asked a series of questions about the implementation of the Program in your Medicare Local. In the survey we are focusing on identifying and describing the Program, the models that are being implemented, and the supporting governance and other arrangements.

Is participation voluntary?
Your decision whether or not to participate will not jeopardise your relationship with the Medicare Local in which you work, other health services with whom you work, the NSW Ministry of Health, Agency for Clinical Innovation, the University of New South Wales or The George Institute for Global Health. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice by filling out the revocation of consent form that was sent to you along with other information about this survey, or by obtaining a copy from the researchers. A copy of this form has been sent to you for you to keep.

Who is on the process evaluation team?
The process evaluation will be conducted by A/Prof Gawaine Powell Davies, Dr Julie McDonald and others from the CPHCE at UNSW.

How will the information be used? The information you provide will be analysed and reported as part of the final evaluation report. Any information that is obtained in connection with this study and that can be identified with you or your Medicare Local will remain confidential and will be disclosed only with your permission, except as required by law. If you give us your permission by answering 'Yes' to Question 1, we plan to include the results in a report to the NSW Ministry of Health, and may seek permission from the Ministry to publish papers on the evaluation. In any publication, information will be provided in such a way that you or your Medicare Local cannot be identified. How will your privacy be protected? No individuals or individual Medicare Locals will be identified in any reporting of findings. All information collected from you will be stored in password-protected databases, and locked filing cabinets and will be disclosed only with your consent or except as required by law. Risks and benefits. We are not aware of any risk to your or your Medicare Local in taking
part in the process evaluation. Likely benefits are from the final evaluation report and
associated dissemination activities which may assist in the ongoing program
development and implementation in your Medicare Local.
Further Information. If you would like more information before you decide, please contact
Dr Julie McDonald, Tel 02 9385 8412.
This research has been approved by the NSW Population & Health Services Research
Ethics Committee HREC/11/CHPHS/69. Should you have concerns about your rights as
a participant in this research, or you have a complaint about the manner in which the
research is conducted, it may be given to the researcher, or, if an independent person is
preferred, to the Ethics Coordinator, Cancer Institute NSW, ph 02 8374 5600.

I consent to take part in the process evaluation by volunteering to participate in an on-line survey and follow up
telephone interview.

☐ Yes - please continue on
☐ No - please log out

INSTRUCTIONS:
Please refer to email sent to you which includes instructions for completing this On-Line Survey

DEMOGRAPHIC DATA

1. Please write the name of your Medicare Local in the box below

...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  
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...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  
...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  

2. Contact Person
Name
...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  
Position
...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  
Contact phone number
...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  
Email address
...............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................  


3. How long have you been employed in the Medicare Local?

- Over 2 years
- 1-2 years
- 6 months - 1 year
- Less than 6 months

**CONTEXT**

4. Looking back, what factors have had a significant influence on your Medicare Local’s involvement in the NSW CDMP?

- ...
- ...
- ...
- ...

**GOVERNANCE AND ENGAGEMENT IN THE NSW CDMP BY THE MEDICARE LOCAL AND GENERAL PRACTICES IN THE AREA**

5. Are the Medicare Local and/or general practices represented on your Local Health District NSW CDMP governance structure?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare Local</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>General Practices</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

6. If ‘No’, or ‘Don’t know’ please comment

- ...
- ...
- ...
- ...
- ...
7. How actively does the Medicare Local contribute to the following?

<table>
<thead>
<tr>
<th>Decision making about the NSW CDMP and its development in the local area</th>
<th>Very active</th>
<th>Active</th>
<th>Not very active</th>
<th>Not active at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disseminating information to general practices in the local area about the NSW CDMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engaging general practices in the local area in the NSW CDMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting local general practices involvement in the NSW CDMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. If 'Not very active', or 'Not active at all', please comment.

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........................................................................................................................................

9. Please estimate the proportion of GPs in your local area who refer patients to the NSW CDMP.

- All/most
- Many
- Some
- A few
- None
- Don’t know
- Not applicable

**MEDICARE LOCAL BASED POSITIONS FUNDED BY THE NSW CDMP**

The following questions relate to care coordinators employed to work on the NSW CDMP and located at the Medicare Local.

10. Are there NSW CDMP-funded care coordinators currently located within your Medicare Local?

- Yes - please continue
- No - Please go to Question 19

11. If yes, please identify the numbers and FTE positions of NSW CDMP Medicare Local-based care coordinators

<table>
<thead>
<tr>
<th>Numbers</th>
<th>FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. Which best describes the role of NSW CDMP Medicare Local-based care coordinators?

- FTE on the NSW CDMP only
- FTE on the NSW CDMP and other programs (if so, list the other program/s below)

13. List other the other program/s.

- [Details]
- [Details]
- [Details]

14. For NSW CDMP Medicare Local-based care coordinators, please estimate what proportion of their time is currently spent on each of the following tasks. (The total should add up to about 100%).

<table>
<thead>
<tr>
<th>Task</th>
<th>&gt;75% of time</th>
<th>50-75% of time</th>
<th>25-50% of time</th>
<th>6&lt;25% of time</th>
<th>0-5% of time</th>
<th>Don’t know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening with GPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening with Aboriginal Community Controlled Health Services/AMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting LHD clinicians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting general practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting patients to navigate their care and self-management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health coaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing clinical care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing telephone support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organising and facilitating referrals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other tasks (1), specify below</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other tasks (2), specify below</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. Please specify other tasks.

<table>
<thead>
<tr>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Description</td>
</tr>
<tr>
<td>Task Description</td>
</tr>
<tr>
<td>Task Description</td>
</tr>
</tbody>
</table>

16. Has the Medicare Local established clinical governance arrangements for the work of any Medicare Local-based NSW CDMP care coordinators?

- [ ] Yes
- [ ] To some extent
- [ ] No
- [ ] Don't know
- [ ] Not applicable

17. If answered 'Yes' or 'To some extent', please describe.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Description</td>
</tr>
</tbody>
</table>

18. Other comments about NSW CDMP Medicare Local-based care coordinators (optional).

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment</td>
</tr>
<tr>
<td>Comment</td>
</tr>
<tr>
<td>Comment</td>
</tr>
</tbody>
</table>
19. Please estimate the proportion of the following groups who have received formal training in health coaching (not necessarily provided through the NSW CDMP).

<table>
<thead>
<tr>
<th></th>
<th>All/most</th>
<th>Some</th>
<th>None</th>
<th>Don’t know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW CDMP-funded care coordinators (ML-based)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Other Medicare Local staff working with patients enrolled in the NSW CDMP, please list below</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>General practice staff</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**SUPPORTING ARRANGEMENTS**

20. Please list any areas where clinical pathways have been developed/modified to include referral to the NSW CDMP.

1. 
2. 
3. 
4. 
5. 

21. Are there systems in place for electronic sharing of information (including shared electronic patient records) about patients enrolled in the NSW CDMP?

<table>
<thead>
<tr>
<th>From the Medicare Local to the Local Health District</th>
<th>Yes</th>
<th>To some extent</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>From the Local Health District to the Medical Local</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>From the Medicare Local to General Practices</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>From General Practices to the Medicare Local</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>From the Local Health District to General Practices</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>From General Practices to the Local Health District</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
22. Do the following groups have access to any care plans developed/compiled by the Local Health District for patients enrolled in the NSW CDMP?

<table>
<thead>
<tr>
<th></th>
<th>For all/most patients</th>
<th>For many patients</th>
<th>For some patients</th>
<th>For a few patients</th>
<th>For no patients</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW CDMP/Medicare Local-based care coordinators</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>GP/practice staff</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Other groups, please list below</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

23. Please list other groups.

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24. Comments on sharing information between the LHD, ML and general practices in the local area on patients enrolled in the NSW CDMP (optional).

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VULNERABLE POPULATIONS

25. Does your Medicare Local have specific arrangements for supporting referrals from the following groups (who meet the Program’s eligibility criteria) into the NSW CDMP?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal people</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Frail aged population</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>People from CALD backgrounds</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>People living in rural and remote areas</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>People with comorbid mental health conditions</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
26. If 'Yes', please describe.

..........................................................................................................................
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ABORIGINAL PATIENTS

The following questions relate to care and management of Aboriginal people living with chronic disease.

27. Is your Medicare Local involved in the planning of health services at a regional level for the care and management of Aboriginal people living with chronic disease?
   - Yes
   - No
   - Don't know

28. If 'Yes', please list the organisations involved and the lead agency and, if applicable, the relevant programs.

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29. Where Aboriginal people are eligible for BOTH the NSW Chronic Disease Management Program AND the Care Coordination and Supplementary Services Program, to what extent are the following arrangements in place to coordinate their care?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>To some extent</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>A CDMP and CCSS Program clinical coordinating group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared positions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular case-conferences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint case management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please describe below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
30. Please describe any other arrangements not mentioned above.

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31. What else do we need to know about your Medicare Local’s involvement in the NSW CDMP in order to understand your responses to this survey?

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Thank you for responding to this survey
5.3 CDMP Minimum Data Set data variables included in the CDMP Outcomes Register

- Project Person number
- LHD of enrolment
- Sex
- Aboriginal or Torres Strait Islander
- Date of birth
- Date of Death
- Postcode of residence
- Date registered
- Enrolment decision date
- Program consent
- Program consent date
- Comprehensive assessment date
- Program exit date
- Target diagnoses
- CDMP source of referral
- Risk of hospitalisation
- Special population flags
- SF1
- Initial intervention
- Initial intervention date
- Care plan
- Care plan date
- Referral target
- Reasons for non-enrolment
- Review process date
- Intervention Recommended and received
- Onward referral recommended
- Extract date
5.4 Data variables included in the CDMP Outcomes Register

Records derived from NSW Chronic Disease Management Program Minimum dataset:

- Project Person number
- Local Health District of enrolment
- Sex
- Aboriginal or Torres Strait Islander
- Date of birth
- Date of Death
- Postcode of residence
- Date registered
- Enrolment decision date
- Program consent
- Program consent date
- Comprehensive assessment date
- Program exit date
- Target diagnoses
- CDMP source of referral
- Risk of hospitalisation
- Special population flags
- Healthways start date*
- Healthways finish date*
- SF1
- Initial intervention
- Initial intervention date
- Care plan
- Care plan date
- Referral target
- Reasons for non-enrolment
- Review process date
- Intervention Recommended and received
- Onward referral recommended
- Extract date

* Only for CDMP participants who had completed the Healthways Program.

Records derived from the Healthways health coaching program:

- Project person number

Records derived from the NSW Admitted Patient Data Collection:

- Project Person Number
- Aboriginal or TSI (ABTSI)
- Aboriginal/TSI? (Mapped)
- Sex
- Age (years)
- Age group
- Postcode
- LHD of residence
- Statistical Local Area of residence:
• Marital status
• Country of Birth (SACC)
• Date of Admission
• Date of Separation
• Length of Stay (LOS)
• Emergency Status
• Source of Referral (general)
• Episode sequence number
• Separation Mode (Mapped)
• Referral to on Separation (general)
• LHD of Hospital
• Hospital
• Hospital Role
• Acute Hospital Flag (YIN)
• HCDB facility peer group
• Recognised public hospital flag
• Insurance status
• Australian National DRG (ANDRG) V4
• Major Diagnostic Category (MDC) for ANDRG — current version 3
• Service category (Mapped)
• Hospital dataset
• HIE stay number (encrypted)
• Day Stay Flag
• Transferred to Hospital
• Transferred from Hospital
• Principal Diagnosis
• Additional Diagnoses (ICD10): Diagnoses 2-10
• Principal procedure (ICD10)
• Additional procedures: Procedures 2-10 (ICD10)
• Service Related Group version 3
• Principal Procedure Block
• Additional Procedure Blocks
• Date of principal procedure
• Cost weights
• Diagnostic Related Group (v6) and text description
• National Weighted Activity Unit — 09/10
• National Weighted Activity Unit — 11/12
• Public Equiv Model 2012
• Public Equiv Model 2013

**Records derived from the NSW Emergency Department Data Collection:**
• Project Person Number
• Aboriginality
• Aboriginal/TSI! (Mapped for historical analysis)
• Age
• Sex
• Postcode
• Marital status
• Country of birth
• Language spoken at home
• LHD of hospital
• LHD of residence
• Patient Arrival Date/Time
• Actual Departure Date/Time
• Hospital code
• Insurance Status
• Referred by
• Referred to on Departure
• Primary Emergency Department Diagnosis (ICD10)
• Triage Category:
• Type of visit

*Records derived from the NSW Registry of Births Deaths and Marriages*

• Project Person Number
• Date of death
5.5 Construction of composite variables for sub analysis

The composite variables for the process evaluation sub analysis are based on LHD responses to a range of questions (listed below). Each LHD’s responses were scored either below (“0”), on (“1”), or above the median (“2”). These median scores were then averaged to produce the overall composite score at the LHD level. These LHD-level composite scores were then grouped for the purposes of analysis as follows:

**PRIMARY CARE ORIENTATION**
- Estimated proportion of GP referrals
- Estimated proportion of GP develop care coordination plans
- Estimated proportion of GPs access to care coordination plans
- Estimated proportion of GPs who coordinate care
- Estimated proportion of ML do comp assessments
- Estimated proportion of ML develop care coordination plans
- Estimated proportion of ML who coordinate care
- Estimated proportion of ML CC role spent on GP liaison
- Estimated proportion of ML CC role spent GP support

**LHD ORIENTATION**
- Estimated proportion of patients referred from LHD hospitals
- Estimated proportion of patients referred from all hospitals
- Estimated proportion of patients referred from chronic disease rehab programs/services
- Estimated proportion of patients referred from other LHD programs/services
- Estimated proportion of LHD CC develop care coordination plan
- Estimated proportion of other LHD clinicians develop care coordination plan
- Estimated proportion of LHD CC coordinate care
- Estimated proportion of LHD CD services coordinate care
- Estimated proportion of LHD aged care services coordinate care
- Estimated proportion of LHD other clinicians coordinate care

**REFERRALS NOT FROM LHD HOSPITALS**
- Estimated proportion of patients not referred from LHD hospitals

**USE OF TELEPHONE SUPPORT (+/- SOME FACE TO FACE CARE)**
- Estimated proportion of patients who are receiving phone support only
- Estimated proportion of patients who are receiving phone support & some face to face care

**PRIMARY CARE INFORMATION SYSTEM CAPACITY**
- Reach of electronic information systems (LHD & GPs)
- Reach of electronic information systems (LHD & MLs)
- GP access to electronic information systems
- ML access to electronic information systems

**LHD INFORMATION SYSTEM CAPACITY**
- Reach of information systems across the LHD
- LHD access to electronic information systems
- Adequacy of clinical information systems

**INTEGRATION OF CDMP INTAKE ARRANGEMENTS WITH OTHER PROGRAMS’ INTAKE ARRANGEMENTS**

- Integration of intake with Aboriginal 48 hour follow-up
- Integration of intake with community health services
- Integration of intake with aged care services

**STANDARD INSTRUMENTS FOR PROGRAM MONITORING AND REVIEW**

**Tools**
- Tools to support enrolment decisions
- Comprehensive assessments with some standards or common elements

**Monitoring/review**
- Systems for monitoring progress of patients across the CDMP
- Systems for reviewing program reach (eligible patients)
- Systems for reviewing program reach (eligible population) Matching Quality

The questions used to construct the composites were as follows:

<table>
<thead>
<tr>
<th>Questions</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 5: Please estimate the proportions of patients currently being enrolled</td>
<td>0-5%</td>
<td>0-5% - 25% - &lt;50%</td>
</tr>
<tr>
<td>that are identified/referred from general practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 16: Please estimate the proportion of CDMP care plans developed by</td>
<td>6-&lt;25%</td>
<td>0-5% - &gt;75%</td>
</tr>
<tr>
<td>general practices for patients allocated to care coordination/case</td>
<td></td>
<td></td>
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<tr>
<td>management.</td>
<td></td>
<td></td>
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<tr>
<td>Q 18: Please estimate how many clinicians within general practice who are</td>
<td>Some</td>
<td>None - All/most</td>
</tr>
<tr>
<td>involved in the care of patients in the NSW CDMP can access the care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>coordination plan (where they have not developed the care plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>themselves).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 13: Please estimate the proportion of comprehensive assessments that</td>
<td>6-&lt;25%</td>
<td>0-5% - &gt;75%</td>
</tr>
<tr>
<td>is undertaken or compiled by ML-based care coordinators for patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>enrolled in the NSW CDMP.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 16: Please estimate the proportion of CDMP care plans developed by</td>
<td>25-50%</td>
<td>0-5% - &gt;75%</td>
</tr>
<tr>
<td>ML-based care coordinators for patients allocated to care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>coordination/case management.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 25: Please estimate the proportion of patients enrolled in the NSW</td>
<td>6&lt;25%</td>
<td>0-5% - 50-75%</td>
</tr>
<tr>
<td>CDMP for whom a ML-based NSW CDMP care coordinator coordinates the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>implementation of the care plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 25: Please estimate the proportion of patients enrolled in the NSW</td>
<td>0-5%</td>
<td>0-5% - 25% - &lt;50%</td>
</tr>
<tr>
<td>CDMP for whom a GP/PN coordinates the implementation of the care plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 50: If there are Medicare Local-based care coordinators, please estimate</td>
<td>25-%50%</td>
<td>6&lt;25% - 50-75%</td>
</tr>
<tr>
<td>the proportion of their time currently spent on liaising with GPs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Proportion of time spent on supporting general practices</td>
<td>6-25%</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>LHD Orientation</td>
<td>Q 5: Please estimate the proportions of patients currently being enrolled that are identified/referred from hospitals in the LHD (inpatients or ED presentations)</td>
<td>50-75%</td>
</tr>
<tr>
<td></td>
<td>Q 5: Please estimate the proportions of patients currently being enrolled that are identified/referred from the patient flow portal (includes all hospitals in NSW).</td>
<td>0-5%</td>
</tr>
<tr>
<td></td>
<td>Q 5: Please estimate the proportions of patients currently being enrolled that are identified/referred from chronic disease rehabilitation programs.</td>
<td>6-25%</td>
</tr>
<tr>
<td></td>
<td>Q 5: Please estimate the proportions of patients currently being enrolled that are identified/referred from other LHD services/programs.</td>
<td>0-5%</td>
</tr>
<tr>
<td></td>
<td>Q 16: Please estimate the proportion of CDMP care plans developed by LHD-based care coordinators for patients allocated to care coordination/case management.</td>
<td>50-75%</td>
</tr>
<tr>
<td></td>
<td>Q 16: Please estimate the proportion of CDMP care plans developed by other LHD clinicians for patients allocated to care coordination/case management.</td>
<td>6-25%</td>
</tr>
<tr>
<td></td>
<td>Q 25: Please estimate the proportion of patients enrolled in the NSW CDMP for whom a LHD-based NSW CDMP care coordinator coordinates the implementation of the care plan.</td>
<td>50-75%</td>
</tr>
<tr>
<td></td>
<td>Q 25: Please estimate the proportion of patients enrolled in the NSW CDMP for whom LHD chronic disease programs/services coordinates the implementation of the care plan.</td>
<td>6-25%</td>
</tr>
<tr>
<td></td>
<td>Q 25: Please estimate the proportion of patients enrolled in the NSW CDMP for whom LHD aged care services coordinate the implementation of the care plan.</td>
<td>0-5%</td>
</tr>
<tr>
<td></td>
<td>Q 25: Please estimate the proportion of patients enrolled in the NSW CDMP for whom other LHD-based clinicians/services coordinate the implementation of the care plan.</td>
<td>0-5%</td>
</tr>
<tr>
<td>Proportion of referrals not from LHD hospitals</td>
<td>Q 5: Please estimate the proportions of patients currently being enrolled that are identified/referred from hospitals in the LHD (inpatients or ED presentations)</td>
<td>50-75%</td>
</tr>
<tr>
<td>Use of telephone support (+/- some face to face)</td>
<td>Q 23. Please estimate the proportion of enrolled patients who are currently receiving telephone support only (e.g. care navigation, SMS)</td>
<td>6-25%</td>
</tr>
<tr>
<td></td>
<td>Q 23. Please estimate the proportion of enrolled patients who are currently receiving telephone support &amp; some occasional face to face care (e.g. care navigation, SMS, clinical care)</td>
<td>6-25%</td>
</tr>
<tr>
<td>Primary care information system capacity</td>
<td>Q 53: Are there systems for electronic sharing of information (including shared electronic patient records) about patients enrolled in the NSW CDMP between the LHD and general practices?</td>
<td>In Part</td>
</tr>
<tr>
<td>Question</td>
<td>LHD information system capacity</td>
<td>Channel settings for intake arrangements with other programs' intake arrangements</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Q 53: Are there systems for electronic sharing of information (including shared electronic patient records) about patients enrolled in the NSW CDMP between the LHD and ML?</td>
<td>In Part</td>
<td>No - yes</td>
</tr>
<tr>
<td>Q 54: If answered Yes/In Part to Q. 53, please nominate whether general practices can access these systems</td>
<td>A Few</td>
<td>None - All/most</td>
</tr>
<tr>
<td>Q 54: If answered Yes/In Part to Q. 53, please nominate whether the Medicare Local can access these systems</td>
<td>A Few</td>
<td>None - All/most</td>
</tr>
<tr>
<td>Q 53: Are there systems for electronic sharing of information (including shared electronic patient records) about patients enrolled in the NSW CDMP across the LHD?</td>
<td>Yes</td>
<td>In part - yes</td>
</tr>
<tr>
<td>Q 54: If answered Yes/In Part to Q. 53, please nominate whether LHD services can access these systems</td>
<td>All/Most</td>
<td>Some - All/most</td>
</tr>
<tr>
<td>Q 55: How adequately is the NSW CDMP currently supported by local clinical information systems (e.g. CHIME/CERNER)?</td>
<td>Partly</td>
<td>Not at all - Fully supported</td>
</tr>
<tr>
<td>Q 59: If you currently have an intake centre/s for patients in the Program, to what extent are they currently integrated with the intake arrangements for the Aboriginal 48 hour follow-up (LHD)?</td>
<td>Partly</td>
<td>Not - fully integrated</td>
</tr>
<tr>
<td>Q 59: If you currently have an intake centre/s for patients in the Program, to what extent are they currently integrated with the intake arrangements for community health services (LHD)?</td>
<td>Partly</td>
<td>Not - fully integrated</td>
</tr>
<tr>
<td>Q 59: If you currently have an intake centre/s for patients in the Program, to what extent are they currently integrated with the intake arrangements for aged care services (LHD)?</td>
<td>Partly</td>
<td>Not - fully integrated</td>
</tr>
<tr>
<td>Q 8: Are any tools used to support enrolment decisions?</td>
<td>Yes</td>
<td>No - yes</td>
</tr>
<tr>
<td>Q 12: Which best describes the current approach to comprehensive assessments for patients enrolled in the NSW CDMP? (Are there standards or common elements?)</td>
<td>Yes</td>
<td>No - yes</td>
</tr>
<tr>
<td>Q 63: Is there a system (i.e. an organised approach) for monitoring the progress of enrolled patients ACROSS the Program?</td>
<td>Yes</td>
<td>Under development / in part - Yes</td>
</tr>
<tr>
<td>Q 64: Are you monitoring the REACH of the program (i.e. the percentage of eligible patients who are offered enrolment in the NSW CDMP) amongst eligible patients of the LHD?</td>
<td>To some extent</td>
<td>No - yes</td>
</tr>
<tr>
<td>Q 64: Are you monitoring the REACH of the program (i.e. the percentage of eligible patients who are offered enrolment in the NSW CDMP) amongst the eligible population in the LHD catchment area?</td>
<td>To some extent</td>
<td>No - yes</td>
</tr>
</tbody>
</table>
### 5.6 Table of composite scores

<table>
<thead>
<tr>
<th>LHD attributes</th>
<th>Geography</th>
<th>Care coordinator location</th>
<th>Intake arrangements</th>
<th>Governance structure</th>
<th>PC orient. (median)</th>
<th>LHD orient. (median)</th>
<th>Prop. referrals NOT from LHD</th>
<th>Use of ‘phone support +/- some face to face</th>
<th>PC Info System capacity (median)</th>
<th>LHD info system capacity (median)</th>
<th>Integrati on of intake arrangements</th>
<th>Standard instrume nts/program review</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metro (%)</td>
<td>Rural (%)</td>
<td>LHD only (%)</td>
<td>LHD &amp; ML (%)</td>
<td>ML only (%)</td>
<td>Single centre (%)</td>
<td>Other options (%)</td>
<td>Integrat ed (%)</td>
<td>Standro ne (%)</td>
<td>None (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography</td>
<td>Metro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37.5</td>
<td>50</td>
<td>12.5</td>
<td>62.5</td>
<td>37.5</td>
<td>87.5</td>
<td>0.0</td>
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<tr>
<td></td>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>Care Coord. location</td>
<td>Both</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>LHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>Intake arrangement s</td>
<td>Single centre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>Governance structure**</td>
<td>Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Standalone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>Use of ‘phone support +/- face to face</td>
<td>High (re med.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Low (re med.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>PC orient.</td>
<td>High (re med.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Low (re med.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td>LHD orient.</td>
<td>High (re med.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Low (re med.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57.1</td>
<td>42.9</td>
<td>0.0</td>
<td>28.6</td>
<td>71.4</td>
<td>42.9</td>
<td>57.1</td>
</tr>
</tbody>
</table>

* This excludes one program in which the CDMP care coordinators are located solely with the ML.  
** This excludes one program which had no formally articulated governance structure.
5.7 Survey of Aboriginal Community Controlled Health Surveys in NSW

The Evaluation of the delivery and effectiveness for Aboriginal people of the NSW Health Chronic Disease Management Program (Connecting Care in the Community) – Survey of Aboriginal Community Controlled Health Services in NSW –

1. Please enter the name of your Aboriginal Community Controlled Health Service below: ____________

2. What is your role at the Service?
   - [ ] CEO
   - [ ] Practice Manager
   - [ ] Doctor
   - [ ] Aboriginal Health Worker
   - [ ] Nurse
   - [ ] Allied Health Worker
   - [ ] Other __________ (please specify)

   In this section we would like to collect information on your Service.

3. How many days per week does your Service operate (at your primary site)?
   - [ ] Less than 1 day per week
   - [ ] 1 – 4 days per week
   - [ ] 5 days per week or more

4. How many staff does your service employ?
   - [ ] 1 - 20
   - [ ] 21 – 50
   - [ ] 51 - 100
   - [ ] Over 100

5. Does your Service diagnose and treat chronic illness and disease?
   - [ ] Yes
   - [ ] No → Thank you for completing this survey

6. Does your Service have a specific chronic disease program?
In this section we would like to collect information on the involvement of your Service with some key programs run by NSW Health and the Australian Government.

7. Please indicate which of these programs your Service has some involvement with:

<table>
<thead>
<tr>
<th>Program</th>
<th>Our Service has been involved with this Program</th>
<th>Our Service has NOT been involved with this Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>• NSW Health Chronic Care Enhancements</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>• NSW Health Chronic Care for Aboriginal People Program – 48 hour follow up</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>• NSW Health Chronic Care for Aboriginal People Program – One Deadly Step</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>• NSW Health Chronic Disease Management Program (also known as Connecting Care in the Community or Connecting Care)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>• NSW Health Get Health Information and Coaching Service</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>• Australian Government’s Care Coordination and Supplementary Services Program</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>• Australian Government’s Healthy for Life (H4L) Program</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

In this section we would like to ask questions about your Service and use and knowledge of the NSW Health Chronic Disease Management Program (also known as Connecting Care in the Community or simple Connecting Care).

8. Have you heard of the Connecting Care Program?
   □ Yes       □ No → Go to Q24

If you answered ‘Yes’ to Q8, please indicate ‘Yes’ or ‘No’ to the following statements:

9. The Connecting Care Program provides patients with care coordination/case management:
   □ Yes       □ No       □ I don’t know

10. The Connecting Care Program provides patients with self-management support:
    □ Yes       □ No       □ I don’t know

11. If you want to talk to someone about the Connecting Care Program do you have an identified Program contact?
    □ Yes       □ No       □ I don’t know

12. Has your Service made referrals to the Connecting Care Program?
    □ Yes       □ No       □ I don’t know

If you answered ‘Yes’ to Q12 above, has your Service referred a patient to the Connecting Care Program if they had the following conditions (if appropriate):
13. Diabetes

☐ Yes  ☐ No  ☐ I don’t know

14. Congestive heart failure

☐ Yes  ☐ No  ☐ I don’t know

15. Coronary Heart disease

☐ Yes  ☐ No  ☐ I don’t know

16. Chronic Obstructive Pulmonary Disease

☐ Yes  ☐ No  ☐ I don’t know

17. Hypertension

☐ Yes  ☐ No  ☐ I don’t know

18. Asthma

☐ Yes  ☐ No  ☐ I don’t know

19. Kidney Disease

☐ Yes  ☐ No  ☐ I don’t know

20. Other (please specify) __________

21. What would make it easier for your service to work with the Connecting Care Program, such as making referrals? Please specify
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________

22. What have you identified as barriers to your Service/your patients accessing the Connecting Care Program? (please specify)
23. How do you see a partnership working between your service and the Connecting Care Program for the provision of integrated care to people with chronic disease across the spectrum of health care providers? (please specify)

___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________

In this section we would like to collect information on the participation of your Service in structures set up at a local/regional level, such as chronic disease committees or forums, for planning and coordination of services for care and management of people with chronic disease at a local/regional level.

24. Does a representative from your Service attend meetings with the following organisations for the planning of chronic disease care and management services at a local/regional level:

Medicare Locals

☐ Yes regularly

☐ Yes occasionally

☐ No

☐ I don’t know

Local Health District

☐ Yes regularly

☐ Yes occasionally

☐ No

☐ I don’t know

Medicare Local and Local Health District together

☐ Yes regularly

☐ Yes occasionally

☐ No

☐ I don’t know
25. Does your Service receive regular updates or communications relating to chronic disease from the Local Health District?

☐ Yes       ☐ No       ☐ I don’t know

26. Does your Service receive regular updates or communications relating to chronic disease from the Medicare Local?

☐ Yes       ☐ No       ☐ I don’t know

Thank you for completing this survey
5.8 Quality of matching

5.8.1 Distribution of categorical characteristics after matching for Healthways cohorts
5.8.2 Distribution of continuous characteristics after matching for Healthways cohorts

Balance after propensity matching using 1-year baseline (subset=HWAYS)
Means of continuous characteristics

- # ED presentations (12 months)
- # ED presentations (3 months)
- # avoidable admissions (12 months)
- # avoidable admissions (3 months)
- # comorbidities
- # hospital admissions (12 months)
- # hospital admissions (3 months)
- # unplanned admissions (12 months)
- # unplanned admissions (3 months)
- Age - 50
- SEIFA deciles
### 5.8.3 Distribution of categorical characteristics after matching for Aboriginal cohorts

#### Balance after propensity matching using 1-year baseline (subset=INDIG) Distribution of categorical characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control</th>
<th>CDMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
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</tr>
<tr>
<td>ED emergency</td>
<td></td>
<td></td>
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<td>Respiratory disease</td>
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<td>Smoking</td>
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0 10 20 30 40 50 60 70 80 90 100
5.8.4 Distribution of continuous characteristics after matching for Aboriginal cohorts

Balance after propensity matching using 1-year baseline (subset=INDIG)
Means of continuous characteristics

- ED presentations (12 months)
- ED presentations (3 months)
- Avoidable admissions (12 months)
- Avoidable admissions (3 months)
- Comorbidities
- Hospital admissions (12 months)
- Hospital admissions (3 months)
- Unplanned admissions (12 months)
- Unplanned admissions (3 months)
- Age < 50
- SEIFA deciles

[Bar charts illustrating the distribution of continuous characteristics after matching for Aboriginal cohorts]
5.9  LHD specific outcomes

5.9.1  Western Sydney LHD (X740)

Figure 91  Utilisation rates for the matched Western Sydney LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 92  Adjusted differences (Western Sydney LHD)

**Potentially preventable admissions**
Difference (95% CI): 0.357 (0.255; 0.459), p-value < 0.001

**Potentially preventable readmissions**
Difference (95% CI): 0.125 (0.072; 0.179), p-value < 0.001

**ED presentations**
Difference (95% CI): 0.558 (0.383; 0.734), p-value < 0.001

**Potentially preventable bed days**
Difference (95% CI): 2.865 (1.922; 3.808), p-value < 0.001
Figure 93  Average potentially preventable hospitalisation pre and post enrolment for the matched Western Sydney LHD CDMP and Control Cohorts
5.9.2 South East Sydney (X720)

Figure 94 Utilisation rates for the matched South Eastern Sydney LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 95  Adjusted differences (South Eastern Sydney LHD)

Potentially preventable admissions
Difference (95% CI): 0.223 (0.160; 0.285), p-value <0.001

Potentially preventable readmissions
Difference (95% CI): 0.030 (0.013; 0.047), p-value <0.001

ED presentations
Difference (95% CI): 0.267 (0.169; 0.364), p-value <0.001

Potentially preventable bed days
Difference (95% CI): 1.036 (0.583; 1.488), p-value <0.001
Figure 96  Average potentially preventable hospitalisation pre and post enrolment for the matched South Eastern Sydney LHD CDMP and Control Cohorts
5.9.3 Illawarra Shoalhaven (X730)

Figure 97 Utilisation rates for the matched Illawarra Shoalhaven LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 98  Adjusted differences (Illawarra Shoalhaven LHD)

Potentially preventable admissions

Difference (95% CI): 0.291 (0.213; 0.369), p-value <.001

Potentially preventable readmissions

Difference (95% CI): 0.063 (0.041; 0.085), p-value <.001

ED presentations

Difference (95% CI): 0.415 (0.267; 0.563), p-value <.001

Potentially preventable bed days

Difference (95% CI): 1.466 (0.653; 2.280), p-value <.001
Figure 99  Average potentially preventable hospitalisation pre and post enrolment for the matched Illawawarrah Shoalhaven LHD CDMP and Control Cohorts
5.9.4 Hunter New England (X800)

Figure 100 Utilisation rates for the matched Hunter New England LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 101 Adjusted differences (Hunter New England LHD)

- **Potentially preventable admissions**
  - Difference (95% CI): 0.378 (0.295; 0.461), p-value <.001

- **Potentially preventable readmissions**
  - Difference (95% CI): 0.100 (0.064; 0.136), p-value <.001

- **ED presentations**
  - Difference (95% CI): 0.620 (0.437; 0.803), p-value <.001

- **Potentially preventable bed days**
  - Difference (95% CI): 1.977 (1.303; 2.651), p-value <.001
Figure 102 Average potentially preventable hospitalisation pre and post enrolment for the matched Hunter New England LHD CDMP and Control Cohorts
5.9.5 Central Coast (X770)

Figure 103 Utilisation rates for the matched Central Coast LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 104 Adjusted differences (Central Coast LHD)

**Potentially preventable admissions**

Difference (95% CI): 0.351 (0.255; 0.447), p-value <.001

**Potentially preventable readmissions**

Difference (95% CI): 0.059 (0.032; 0.086), p-value <.001

**ED presentations**

Difference (95% CI): 0.249 (0.090; 0.407), p-value =.002

**Potentially preventable bed days**

Difference (95% CI): 2.985 (2.207; 3.762), p-value <.001
Figure 105 Average potentially preventable hospitalisation pre and post enrolment for the matched Central Coast LHD CDMP and Control Cohorts
5.9.6 Mid North Coast (X820)

Figure 106 Utilisation rates for the matched Mid North Coast LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 107 Adjusted differences (Mid North Coast LHD)

Potentially preventable admissions
Difference (95% CI): 0.410 (0.224; 0.596), p-value <.001

Potentially preventable readmissions
Difference (95% CI): 0.047 (-0.008; 0.102), p-value >.096

ED presentations
Difference (95% CI): 0.478 (0.211; 0.745), p-value <.001

Potentially preventable bed days
Difference (95% CI): 2.596 (1.089; 4.103), p-value <.001
Figure 108 Average potentially preventable hospitalisation pre and post enrolment for the matched Mid North Coast LHD CDMP and Control Cohorts
Figure 109 Utilisation rates for the matched Murrumbidgee LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 110 Adjusted differences (Murrumbidgee LHD)

**Potentially preventable admissions**
Difference (95% CI): 0.163 (0.010; 0.316), p-value = 0.036

**Potentially preventable readmissions**
Difference (95% CI): 0.064 (0.000; 0.127), p-value = 0.050

**ED presentations**
Difference (95% CI): 0.572 (0.138; 1.005), p-value = 0.010

**Potentially preventable bed days**
Difference (95% CI): 0.785 (-0.317; 1.887), p-value = 0.163
Figure 111 Average potentially preventable hospitalisation pre and post enrolment for the matched Murrumbidgee LHD CDMP and Control Cohorts
5.9.8 Nepean Blue Mountains (X750)

Figure 112 Utilisation rates for the matched Nepean Blue Mountains LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 113 Adjusted differences (Nepean Blue Mountains LHD)

Potentially preventable admissions
Difference (95% CI): 0.237 (0.104; 0.370), p-value < .001

Potentially preventable readmissions
Difference (95% CI): 0.025 (-0.074; 0.124), p-value = 0.626

ED presentations
Difference (95% CI): 0.355 (0.012; 0.698), p-value = 0.043

Potentially preventable bed days
Difference (95% CI): 2.255 (1.190; 3.320), p-value < .001
Figure 114 Average potentially preventable hospitalisation pre and post enrolment for the matched Nepean Blue Mountains LHD CDMP and Control Cohorts
5.9.9 Northern NSW (X810)

Figure 115 Utilisation rates for the matched Northern NSW LHD CDMP and Control cohort

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 116 Adjusted differences (Northern NSW LHD)

Potentially preventable admissions
Difference (95% CI): 0.081 (-0.047; 0.209), p-value = 0.213

Potentially preventable readmissions
Difference (95% CI): 0.007 (-0.053; 0.066), p-value = 0.830

ED presentations
Difference (95% CI): 0.055 (-0.213; 0.324), p-value = 0.686

Potentially preventable bed days
Difference (95% CI): 0.968 (0.027; 1.909), p-value = 0.044
Figure 117 Average potentially preventable hospitalisation pre and post enrolment for the matched Northern NSW LHD CDMP and Control Cohorts

![Graph showing average potentially preventable hospitalisation pre and post enrolment for matched Northern NSW LHD CDMP and Control Cohorts.](image-url)
5.9.10 Northern Sydney (X760)

Figure 118 Utilisation rates for the matched Northern Sydney LHD CDMP and Comparison cohort

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 119 Adjusted differences (Northern Sydney LHD)

Potentially preventable admissions
Difference (95% CI): 0.299 (0.207; 0.392), p-value <.001

Potentially preventable readmissions
Difference (95% CI): 0.046 (0.014; 0.078), p-value =0.005

ED presentations
Difference (95% CI): 0.357 (0.209; 0.506), p-value <.001

Potentially preventable bed days
Difference (95% CI): 2.946 (1.941; 3.951), p-value <.001
Figure 120 Average potentially preventable hospitalisation pre and post enrolment for the matched Northern Sydney LHD CDMP and Control Cohorts
Figure 121 Utilisation rates for the matched South Western Sydney LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 122 Adjusted differences (South Western Sydney LHD)

Potentially preventable admissions
Difference (95% CI): 0.320 (-0.073; 0.712), p-value =0.111

Potentially preventable readmissions
Difference (95% CI): 0.126 (-0.050; 0.302), p-value =0.161

ED presentations
Difference (95% CI): 0.696 (-0.080; 1.313), p-value =0.027

Potentially preventable bed days
Difference (95% CI): 2.359 (-1.662; 6.381), p-value =0.250
Figure 123 Average potentially preventable hospitalisation pre and post enrolment for the matched South Western Sydney LHD CDMP and Control Cohorts
5.9.12 **Southern NSW (X830)**

Figure 124 Utilisation rates for the matched Southern NSW LHD CDMP and Control cohorts

- **Potentially preventable admissions**
- **Potentially preventable readmissions**
- **ED presentations**
- **Potentially preventable bed days**
Figure 125 Adjusted differences (Southern NSW LHD)

Potentially preventable admissions
Difference (95% CI): 0.335 (0.145; 0.525), p-value <0.001

Potentially preventable readmissions
Difference (95% CI): 0.044 (0.019; 0.108), p-value =0.168

ED presentations
Difference (95% CI): 0.560 (0.222; 0.898), p-value =0.001

Potentially preventable bed days
Difference (95% CI): 2.378 (0.857; 3.900), p-value =0.002
Figure 126 Average potentially preventable hospitalisation pre and post enrolment for the matched Southern NSW LHD CDMP and Control Cohorts
Figure 127 Utilisation rates for the matched Sydney LHD CDMP and Comparison cohorts
Figure 128 Adjusted differences (Sydney LHD)

Potentially preventable admissions
Difference (95% CI): 0.483 (0.281; 0.686), p-value <.001

Potentially preventable readmissions
Difference (95% CI): 0.083 (0.025; 0.141), p-value =0.005

ED presentations
Difference (95% CI): 0.564 (0.251; 0.877), p-value <.001

Potentially preventable bed days
Difference (95% CI): 4.225 (2.066; 6.384), p-value <.001
Figure 129 Average potentially preventable hospitalisation pre and post enrolment for the matched Sydney LHD CDMP and Control Cohorts
Figure 130 Utilisation rates for the matched Western NSW LHD CDMP and Control cohorts

- Potentially preventable admissions
- Potentially preventable readmissions
- ED presentations
- Potentially preventable bed days
Figure 131 Adjusted differences (Western NSW LHD)

**Potentially preventable admissions**
Difference (95% CI): 0.357 (0.201; 0.502), p-value <.001

**Potentially preventable readmissions**
Difference (95% CI): 0.098 (0.028; 0.167), p-value =.006

**ED presentations**
Difference (95% CI): 0.501 (0.286; 0.715), p-value <.001

**Potentially preventable bed days**
Difference (95% CI): 2.488 (1.394; 3.582), p-value <.001
5.9.15 Far West (X860)

As the number of CDMP Evaluation cohort participants enrolled and registered in Far West LHD was so small, analyses of this cohort's patterns of health service utilisation were not possible.
## 5.10 Identifying predictors of outcomes

<table>
<thead>
<tr>
<th>Variable/Category</th>
<th>CDMP Mean (95% CI)</th>
<th>Control Mean (95% CI)</th>
<th>Difference Mean (95% CI)</th>
<th>Interaction p-value</th>
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<td>0.94 (0.90; 0.98)</td>
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<td>1.18 (1.08; 1.28)</td>
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<td>0.89 (0.73; 1.04)</td>
<td>0.52 (0.27; 0.77)</td>
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<td><strong>AHS</strong></td>
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<tr>
<td>Greater Southern AHS</td>
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<td>0.75 (0.63; 0.87)</td>
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<td>Greater Western AHS</td>
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<td>Hunter New England AHS</td>
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<td>0.73 (0.64; 0.83)</td>
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<td>North Coast AHS</td>
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<td>Northern Sydney Central Coast</td>
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<td>0.62 (0.52; 0.72)</td>
<td>0.35 (0.23; 0.48)</td>
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<td>South Eastern Sydney Illawarra</td>
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<td>0.59 (0.54; 0.65)</td>
<td>0.30 (0.23; 0.37)</td>
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<td>Sydney South West AHS</td>
<td>1.17 (1.02; 1.33)</td>
<td>1.06 (0.93; 1.19)</td>
<td>0.11 (-0.09; 0.31)</td>
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<tr>
<td>Sydney West AHS</td>
<td>1.40 (1.19; 1.61)</td>
<td>0.80 (0.73; 0.87)</td>
<td>0.60 (0.38; 0.82)</td>
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<td>X690</td>
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<td>0.64 (0.36; 0.91)</td>
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<td>70 to 74</td>
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<td>85 and more</td>
<td>1.06 (0.98; 1.14)</td>
<td>0.76 (0.66; 0.86)</td>
<td>0.30 (0.17; 0.42)</td>
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<tr>
<td><strong>ARIA</strong></td>
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<td>Outer Regional Australia</td>
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<td>0.69 (0.47; 0.90)</td>
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# potentially preventable admissions in preceding year
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<th>2 or more</th>
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<td>0.28 (0.24; 0.31)</td>
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<td>1</td>
<td>0.95 (0.90; 1.01)</td>
<td>0.66 (0.60; 0.71)</td>
<td>0.30 (0.22; 0.38)</td>
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<td>2 or more</td>
<td>2.28 (2.12; 2.44)</td>
<td>1.78 (1.66; 1.89)</td>
<td>0.51 (0.31; 0.71)</td>
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<table>
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<td>0.26 (0.22; 0.29)</td>
<td>0.36 (0.27; 0.45)</td>
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<td>1</td>
<td>0.66 (0.60; 0.71)</td>
<td>0.33 (0.30; 0.35)</td>
<td>0.33 (0.27; 0.39)</td>
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<td>2</td>
<td>0.87 (0.81; 0.93)</td>
<td>0.54 (0.48; 0.61)</td>
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<td>3</td>
<td>1.01 (0.93; 1.09)</td>
<td>0.62 (0.55; 0.68)</td>
<td>0.39 (0.29; 0.49)</td>
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<td>0.33 (0.29; 0.37)</td>
<td>0.31 (0.23; 0.40)</td>
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<tr>
<td>1</td>
<td>0.68 (0.64; 0.72)</td>
<td>0.44 (0.40; 0.48)</td>
<td>0.23 (0.18; 0.29)</td>
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<tr>
<td>2</td>
<td>1.09 (1.02; 1.16)</td>
<td>0.76 (0.68; 0.83)</td>
<td>0.33 (0.23; 0.44)</td>
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<tr>
<td>3 or more</td>
<td>1.80 (1.67; 1.94)</td>
<td>1.39 (1.29; 1.49)</td>
<td>0.41 (0.25; 0.58)</td>
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</tbody>
</table>

**Target condition: Diabetes**

| No | 0.78 (0.74; 0.82) | 0.46 (0.43; 0.48) | 0.33 (0.28; 0.37) |
| Yes| 2.24 (2.09; 2.39) | 1.84 (1.71; 1.98) | 0.40 (0.20; 0.59) |

**Target condition: COPD**

| No | 0.89 (0.86; 0.93) | 0.59 (0.56; 0.62) | 0.31 (0.26; 0.35) |
| Yes| 1.98 (1.78; 2.17) | 1.39 (1.27; 1.51) | 0.59 (0.36; 0.82) |

**Target condition: CAD**

| No | 1.16 (1.11; 1.22) | 0.75 (0.72; 0.79) | 0.41 (0.35; 0.48) |
| Yes| 0.70 (0.66; 0.75) | 0.54 (0.48; 0.60) | 0.17 (0.09; 0.24) |

**Target condition: Hypertension**

| No | 1.06 (1.02; 1.10) | 0.70 (0.67; 0.74) | 0.36 (0.30; 0.41) |
| Yes| 0.59 (0.43; 0.74) | 0.66 (0.36; 0.96) | -0.07 (-0.41; 0.26) |

**Target condition: CHF**

| No | 0.96 (0.92; 1.00) | 0.62 (0.59; 0.65) | 0.34 (0.29; 0.39) |
| Yes| 1.88 (1.66; 2.09) | 1.46 (1.32; 1.60) | 0.42 (0.16; 0.67) |
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