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Health service use in the older person with complex health needs

Mark Bartlett[1,4] RGN, BSc DipEd, GradDipAppEpi, MPH, Manager, Analysis for Policy Program
Joanna Wang[1] BSc (Advanced Mathematics) (Hons), PhD, Research Fellow in Biostatistics
Liz Hay[2] BEco (SOC SCi) (Hons), Director, Economics and Analysis, Leading Better Value Care Team
Glen Pang[3] BSc, MNutrDiet, Network Manager, Aged Health

[1]Sax Institute. PO Box K617 Haymarket NSW 1240. Email: Joanna.Wang@saxinstitute.org.au
[2]NSW Ministry of Health. Locked Mail Bag 961, North Sydney NSW 2059. Email: Liz.Hay@health.nsw.gov.au
[3]NSW Agency for Clinical Innovation. PO Box 699, Chatswood NSW 205.
Email: glen.pang@aci.health.nsw.gov.au
[4]Corresponding author. Email: mark.bartlett@saxinstitute.org.au

Abstract

Objective. Effective health care for older people with complex health needs requires a diverse range of healthcare professionals working together. The Building Partnerships Framework of the New South Wales Agency for Clinical Innovation seeks to promote collaboration and integration among service providers. The aim of the present study was to inform implementation and evaluation of the Framework.

Methods. Data from the 45 and Up Study was linked with deaths and service data from hospitalisations and the Medicare Benefits Schedule (MBS). Participants with a hospitalisation for conditions representing 'geriatric syndrome' were allocated to a complex needs group; the remainder were allocated to a comparison group. Hospital admissions and MBS services use were modelled using log-linear Poisson regression.

Results. Multivariate analysis showed that the rate of hospitalisation in the 2 years following index admission for the complex needs group was 18% (95% confidence interval (CI) 1.12–1.24) greater than the comparison group and specialist physician attendance was 13% (95% CI 1.06 – 1.21) greater. The rate of general practitioner (GP) attendances was 2% (95% CI 0.97–1.07) greater in the complex needs group, but this was not statistically significant.

Discussion. The greater rates of hospitalisation and specialist service use, the absence of a similar finding for GP services and the prominence of the role of primary care in service integration literature, policy and strategy underscore the importance of careful planning, consultation and inclusiveness in the development and implementation of integrated care policy.

What is known about the topic? Older people with complex health needs are significant consumers of primary and secondary health services and benefit from well-planned and coordinated care.
What does this paper add? The findings presented here indicate that although hospitals and specialist physicians provide a significantly greater volume of services to people with complex health needs, GPs do not. Within the limitations of the present study, these findings can contribute to integrated care policy and strategy development and implementation.
What are the implications for practitioners? Given the prominence of primary care in service integration literature, policy and strategy and the findings of the present study with regard to the relative level of GP involvement in the management of people with complex needs, careful policy implementation will be required to ensure GPs are able to contribute significantly to coordinated cooperation between health services.

Additional keywords: geriatric syndrome; integrated care; primary care.

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Introduction

People with complex health needs typically have multiple chronic conditions, frequent hospitalisations and limitations regarding their ability to perform basic daily functions.[1] Effective health care for older people with complex health needs, their carers and families requires a diverse range of healthcare professionals working together, and services must be coordinated through a shared plan with joint accountability.[2] To meet the needs of people with complex health needs, the New South Wales (NSW) Agency for Clinical Innovation (ACI) led the

development of the 'Building Partnerships: Framework for Integrating Care for Older People with Complex Health Needs'.[3] The Framework seeks to promote collaboration and integration among health service providers involved in improving the health of older people with complex needs, their carers and families. The Framework defines an older person with complex health needs as 'One whose underlying co-morbidities and individual circumstances have a direct impact on their ability to function and maintain independence on a daily basis'.[2,3] The older person with complex health needs may be more precisely defined in terms of the presence of 'geriatric syndrome'. 'Geriatric syndrome' captures those clinical conditions in older people that do not fit into discrete disease categories and include delirium, falls, frailty, dizziness, syncope and urinary incontinence. These conditions are highly prevalent in older adults, especially the frail elderly, and their effects on quality of life, disability and health service use is substantial.[4]

In 2011–12, people aged ≥65 years comprised 39% of hospital separations in Australia,[5] and older people typically had longer hospital stays.[6] Between 2007 and 2012, separations for people aged ≥85 years increased in number by 9% each year, compared with a 4% annual rise in overall hospital admissions.[5] People aged ≥85 years had a higher proportion of admissions for sub- and non-acute care, around 2% being for geriatric evaluation and management and 1.5% for maintenance care.[5] Approximately 0.5% of GP attendances in Australia in 2010–11 involved the management of dementia.[7] In 2009–10, dementia was diagnosed in approximately 1% of hospitalisations and was the principal diagnosis in 0.1%.[7] The average length of hospital stay (LOS) for people with dementia is sixfold greater the average LOS.[8] Falls-related hospitalisation is common in people aged >65 years, and the rate in this age group increased by 2.3% per year between 1999 and 2011.[9] Bed days for falls-related admissions in this group accounted for 10.5% of all hospital patient days, and time spent in hospital as a result of a fall increased with age.[10]

To inform the implementation and evaluation of the ACI's Framework and to provide some insight into the continuum of care for people with complex health needs, information on the current service use environment, how people are accessing health services, the type and frequency of services accessed and the nature and quality of communication between services is required. The aim of the present study was to contribute to these information needs by describing and comparing health service use (both primary and secondary) in the older person with complex health needs.

Methods

Data from the Sax Institute's 45 and Up Study[11] linked with routinely collected services data were used in this analysis. The 45 and Up Study is based in the NSW population. Participants were randomly sampled from the Department of Human Services (DHS; formerly Medicare Australia) enrolment database, which provides near-complete coverage of the population. People aged ≥80 years and residents of rural and remote areas were oversampled. In all, 267 153 participants joined the study (between January 2006 and December 2009) and gave consent for follow-up and linkage of their information to routine health databases.[11] The 45 and Up Study receives institutional ethics oversight from the UNSW Human Research Ethics Committee. The present study was approved by the NSW Population and Health Services Research Ethics Committee.

Data from the 45 and Up Study on participants aged ≥65 years at recruitment were probabilistically linked with NSW hospitalisations and deaths registry records. The NSW Centre for Health Record Linkage (CHeReL) performed the linkage. Linkage of the 45 and Up cohort data with the Medicare Benefit Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) data was performed by the Sax Institute using a unique identifier that was provided to the DHS. Hospitalisations data were available to June 2014 and MBS data were available to December 2012.

The study group (i.e. those with a complex health need) was identified from participants' hospitalisation records. The index period (1 July 2009–30 June 2010) was chosen to ensure there were at least 2 years of service use data after the index admission. A participant who had an admission in the index period, where the principal or additional diagnoses were one or more of the conditions representing 'geriatric syndrome' (see Appendix 1), was allocated to the 'complex needs' group. The comparison group was defined as participants with an admission in the index period where the reason for admission was other than 'geriatric syndrome'. The definition of 'geriatric syndrome' was established by an expert group convened by the ACI. All participants with a hospital stay where the principal or additional diagnosis was haemodialysis or fistula creation were excluded from the study population so as not to skew the hospital separations.

MBS items were grouped into general practitioner (GP) attendances or specialist/consulting physician attendances (Appendix 2). Pathology, diagnostic and therapeutic procedures were not assessed. Hospital and MBS services were described for the 24-month period following the index admission; that is, following the first admission for 'geriatric syndrome' (complex needs group) or other reason for admission (comparison group) in the index period. Individual health and lifestyle characteristics were extracted from the self-reported information from the 45 and Up Study.

To model hospital admission and MBS services use in the complex needs and comparison groups, log-linear Poisson regression was used. A negative binomial model was used whenever serious overdispersion was detected. Analysis was performed on the number of hospitalisations or MBS services for each individual, incorporating individual-level health and lifestyle covariates and a measure of the alternative service use. That is, for example, where hospitalisations were being modelled, demographic, health and lifestyle and MBS service use were included as covariates. The logarithm of the follow-up time was used as an offset in the model. To account for censoring of observations due to death, follow-up time was calculated as the difference between the date of death and the date of index admission.

Each of the variables noted above was added to the model, along with the study group indicator, in univariate analysis to evaluate the marginal effect. The multivariate model contained individual-level confounders. Incidence rate ratios and 95%

confidence intervals (CIs) for each variable were calculated by exponentiating the estimated coefficients in the model.

All analyses were performed using SAS version 9.3 (SAS Institute, Cary, NC, USA) and data were stored and accessed via the Secure Unified Research Environment (SURE; Sax Institute).

Results

The study population included 102 888 study participants aged ≥65 years at the time of the baseline survey; 48.3% were female and mean subject age was 74.6 years (range 65.0–106.2 years). Of the study population, 3202 (3.1%) were identified as having had an admission in the index period for 'geriatric syndrome'. The index admission for 78.0% and 49.8% of the complex needs and comparison groups respectively was to a public hospital. Due to the disparate proportions of each of the groups admitted to public and private hospitals, and the very different distribution of principal diagnoses of the complex needs and comparison groups admitted to private hospitals, analyses were confined to admissions to public hospitals. Therefore, analyses were conducted on 2497 participants with complex needs and 17 332 participants in the comparison group.

Comparing the two groups, 57.3% of the complex needs group and 46.7% of the comparison group resided in major cities in NSW. Those in the complex needs group were statistically significantly older than the comparison group, with a mean age of 82.1 and 77.7 years respectively. Sex distribution was similar between the two groups. The index hospital admission for 88.4% of participants in the complex needs group and for 47.3% of the comparison group was a multiday stay. In the 2 years following the index admission, 75.4% of the complex needs group and 93.7% of the comparison group had at least one admission, for any reason, with the complex needs participants having 5132 further separations (25.4% of the complex needs group and 11.1% of the comparison group died in the 2 years following the index admission). The average LOS in the 2 years following index admission was 13.3 and 9.2 days in the complex needs and comparison groups respectively. In the 2 years before the index admission, 17.1% of the complex needs group and 4.2% of the comparison group had had an admission for 'geriatric syndrome'.

Multivariate analysis for hospital admissions (Fig. 1) shows that, after adjusting for covariates, the rate of admission in the 2 years following index admission for the complex needs group was 18% (95% CI 1.12–1.24) greater than that of the comparison group. In addition, after adjusting for remaining covariates, males had an 11% (95% CI 1.07–1.15) greater rate of admission, and each 1-unit increase in the count of comorbidities increased the number of hospital admissions by 5% (95% CI 1.03–1.07). Current smokers had an 11% (95% CI 1.05–1.17) greater rate of hospital admission than non-smokers. Having a Department of Veteran's Affairs Health Entitlement Card or private health insurance reduced the public hospital admission rate by 20% (95% CI 0.75–0.85) and 29% (95% CI 0.69–0.74) respectively. Conversely, having a healthcare concession card was associated

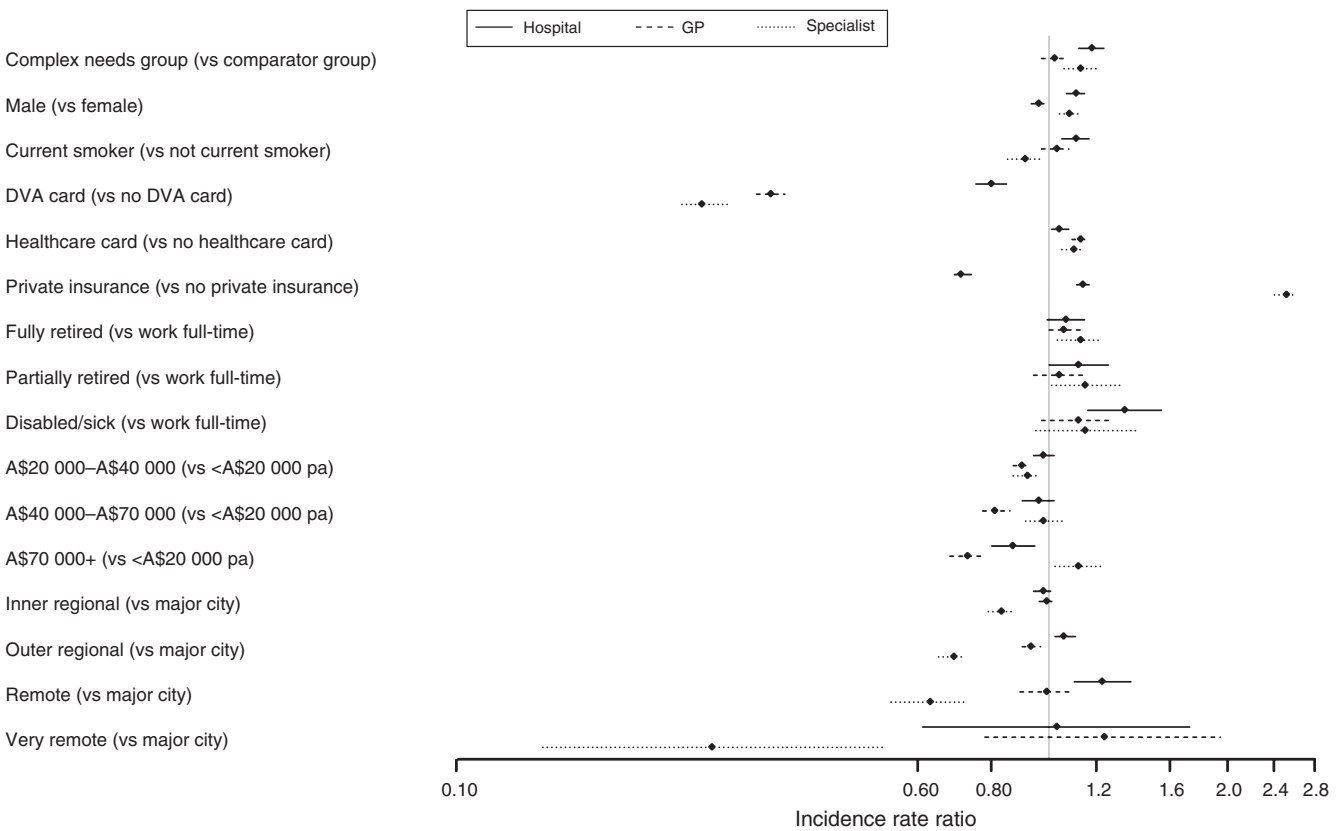

Fig. 1. Adjusted rate of hospital admissions, general practitioner (GP) and specialist physician attendances in the 2 years following index admission in 45 and Up Study participants aged ≥65 years at recruitment defined as having complex needs and a comparison group.

with an increase of 4% in the rate of admission (95% CI 1.01–1.08). Being out of work through disability or illness, compared with full-time employment, was associated with an increased rate of hospital admission of 34%. Conversely, household income of more than A$70 000 was associated with a reduced rate of hospital separations (to public hospitals) of 23%. Participants living in outer regional and remote areas had relatively greater use of hospital services compared with those resident in major cities. The rate of hospital admission was largely unaffected by the number of GP attendances in the same time period, and each additional specialist visit was associated with a 1% increase in hospital admission. Age, alcohol intake and body mass index (BMI) were not associated with differences in admission rate.

Analysis for GP attendances (Fig. 1) shows that, after adjusting for covariates, the rate of attendance in the 2 years following index hospital admission was a non-significant 2% (95% CI 0.97–1.07) higher for the complex needs group. However, after adjusting for covariates, each additional year of age increased the number of GP visits by 1% (95% CI 1.01–1.01), and males were found to have 4% (95% CI 0.93–0.99) fewer GP attendances. Each 1-unit increase in the count of comorbidities increased the number of GP attendances by approximately 7% (95% CI 1.05–1.09), and smoking status, alcohol intake, and BMI had no significant effect. Employment status had no significant effect on attendances, but higher household income was associated with a reduced rate of GP attendance of 10–27%. Having a healthcare concession card or private insurance increased GP attendance by 13% (95% CI 1.09–1.16) and 14% (95% CI 1.11–1.18) respectively, whereas having a DVA card reduced GP attendance by 66% (95% CI 0.32–0.36). Each additional hospitalisation was associated with a 3% (95% CI 1.02–1.04) increase in the rate of GP attendance, and each additional specialist attendance was associated with a 1% (95% CI 1.01–1.01) increase in the rate of GP attendance.

Analysis for specialist physician attendance (Fig. 1) shows that, after adjusting for covariates, the rate of attendance in the 2 years following index admission for the complex needs group was 13% (95% CI 1.06–1.21) greater than that of the comparison group. In addition, after adjusting for the remaining covariates, age had no effect on the rate of specialist attendances, and males had an 8% (95% CI 1.04–1.13) greater rate of attendance than females. Each 1-unit increase in the count of comorbidities increased the number of specialist attendances by 9% (95% CI 1.06–1.11), and alcohol intake and BMI had no significant effect. Being a current smoker was associated with 9% (95% CI 0.85–0.98) fewer specialist attendances than current non-smokers. Having a healthcare card or private health insurance was associated with a 1.10-fold (95% CI 1.05–1.14) and 2.51-fold (95% CI 2.40–2.62) increased rate of specialist visits respectively. Having a DVA card was associated with 74% (95% CI 0.24–0.29) fewer specialist visits. Being fully or partially retired, compared with full-time employment, was associated with an increased rate of specialist attendances of between 13% and 15%. The association between the rate of specialist attendances and household income was mixed, with the highest income category (A$70 000 and over) associated with a 12% (95% CI 1.02–1.23) greater rate of specialist attendances than the lowest income category, and those with an income between A$20 000 and less than A$40 000 having 8% (95% CI 0.87–0.96) fewer visits. Further, increasing residential remoteness was associated with a reduced rate of specialist attendances of 17–73%. In addition, each additional hospitalisation was associated with a 7% (95% CI 1.06–1.07) greater number of specialist attendances, and each additional GP attendance was associated with a 1% (95% CI 1.01–1.01) greater number of specialist attendances.

Discussion

The American Geriatrics Society defines a person with complex health needs as someone whose ‘conditions require complex continuous care and frequently require services from different practitioners in multiple settings’.[12] As a consequence, people with complex health needs, their carers and families often have multiple, disconnected and duplicative interactions with the health system.[3] This study sought to describe primary and secondary healthcare services use by people within the 45 and Up Study who may be considered as having a complex health need.

As one may expect, given the conditions that were considered to define a complex health need, hospital admissions in participants with ‘geriatric syndrome’ were predominantly to public hospitals. The proportion of the complex needs group admitted to public hospitals and the range of conditions that made up the principal reason for admission were both very different to those of the comparison group. Consequently, analysis of hospitalisations performed herein was restricted to admissions to NSW public hospitals. The proportion of the complex needs group who had an admission for any reason in the 2 years following the index admission was smaller than the comparison group. Consistent with other studies,[13,14] a greater proportion had index and subsequent admissions that were multiday stays. The mean number of hospital days used by the complex needs group was almost twice that of the comparison group, and the average LOS 50% greater. It is interesting to note that approximately 4% of the comparison group had an admission for a geriatric syndrome condition in the 2 years before the index period. Although this proportion is small, and substantially less than the complex needs group, it reflects the importance of the case definition and its contribution to the potential for misclassification and, allowing for the effect of the case definition, may indicate transition into and out of wellness and complex illness in this age group.

Adjusted analyses showed that the complex needs group had significantly more frequent hospital admissions. Similarly, after considering the presence of a complex health need, male gender, comorbidities, current smoking, holding a healthcare card, not working due to illness, living in rural and remote NSW and specialist attendances were all associated with greater public hospital use.

Although the crude rates of GP and specialist attendances were greater in the complex needs than comparison group (14.8 and 13.0 GP attendances per person per year respectively; and 8.3 and 6.0 specialist attendances per person per year respectively), the adjusted analysis is more informative. After adjusting for a range of covariates considered to potentially affect GP attendances, few differences were found between the complex needs and comparison groups. This finding is somewhat unexpected given the relative volume of services used by people with

complex health needs, the emphasis on primary care as the main point of contact with the health system and in the management of people with chronic and complex conditions, and the fact that the Australian Government has introduced several funding programs to support and encourage GP management of people with chronic and complex disease.[15–17] It should be noted that crude attendance rates indicate that GPs do indeed have significant contact with people with complex needs; it is just that after adjustment for confounders, this contact is no greater than for people without a complex condition. It has also been observed that although GPs are heavily involved in providing care to people with chronic illness, they provide the majority of care to those whose illness is mild to moderately severe.[16] Therefore, it could be that, indeed, GPs are not heavily involved in the management of people with complex conditions, the role falling predominantly on hospital and specialist services, or, given that the case definition used in the present study required a hospitalisation for the specified conditions, the study group had conditions at the severe end of the spectrum and were less likely to be managed by GPs. An alternative explanation is that the case definition allowed people with complex conditions to enter the comparison group. However, as noted above, only a small proportion of the comparison group had a prior hospital admission for a complex illness, making the likely effect of misclassification small. In addition, if misclassification were significant, one may have expected the relationship between specialist service use and complex illness to be similarly affected. This was not the case.

The most prominent factors affecting GP use were female gender, the number of comorbidities, holding a DVA card, healthcare concession card or private health insurance, household income and use of hospital services. The causal direction of the association with hospitalisations (and specialist attendances) cannot be determined. That is, it is not known whether more frequent hospitalisations (or specialist visits) resulted from or lead to more GP visits.

Unlike the GP analysis, adjusted specialist service use shows that the complex needs group has significantly more frequent specialist visits. The reasons for this observation are likely to be the converse of those explored above regarding GP service use.

In addition, after considering the presence of a complex health need, male gender, comorbidities, having private health insurance or a healthcare card, being fully or partially retired, greater household income and the use of hospital services are all associated with greater specialist service use. Smoking, holding a DVA card and living in rural and remote NSW are associated with significantly fewer specialist attendances. Health inequalities in rural and remote areas are well documented. Even though the present study found that rural and remote residence was generally associated with fewer GP attendances, rural and remote health service provision is usually considered as being more dependent on primary health care, there being less health infrastructure and fewer locally available specialist services. Limited access to specialist health professionals beyond metropolitan areas is a significant challenge for health service delivery in rural and remote areas.[18]

The principal limitation in these analyses is the method for identifying the study group. That is, using a health service event (hospitalisation) to identify a group of people on whom to measure and compare future health service events will undoubtedly introduce selection bias and affect the generalisability of the results. It may be beneficial to compare and validate the definition used here by repeating the analyses using a definition of 'geriatric syndrome' derived from self-reported falls, urinary incontinence and general health decline. This information is captured in the 45 and Up Study.

Conclusion

In conclusion, the multivariable models indicate that both rates of hospitalisation and specialist physician attendance are significantly greater in people with a complex health need, both in their own right and as a confounder of the alternative services use. Conversely, there is no significant difference in the rate of GP attendance. Given this, and the prominence of primary care in service integration literature, policy and strategy, careful planning and policy implementation will be required to ensure GPs are able to contribute significantly to coordinated cooperation between health services.

Competing interests

The authors declare that there are no significant competing financial, professional or personal interests that may have influenced the performance or presentation of the work described herein.

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Appendix 1. International Classifications of Diseases 10th Revision Australian Modification (ICD-10-AM) codes that define 'geriatric syndrome'.[19]
NEC, not elsewhere classifiable. The † (denoting aetiology) and * (denoting manifestation) symbols are an ICD-10-AM standard system and are interpreted as a hierarchical pair

Dementia (persisting) F03
- alcoholic F10.7
- Alzheimer's type NEC (see also Dementia/in/Alzheimer's disease) G30.9†, F00.9*
- arteriosclerotic (see also Dementia/vascular) F01.9
- atypical, Alzheimer's type G30.8†, F00.2*
- degenerative (primary) F03
- frontal lobe G31.0†, F02.0*
- frontotemporal G31.0†, F02.0*
- in (due to)
  - alcohol F10.7
  - Alzheimer's disease G30.9†, F00.9*
    - with onset
      - early (presenile form) G30.0†, F00.0*
      - late (senile form) G30.1†, F00.1*
    - atypical G30.8†, F00.2*
    - mixed type G30.8†, F00.2*
  - anxiolytic F13.7-
  - arteriosclerotic brain disease F01.9
  - cerebral lipidoses E75.-†, F02.8*
  - Creutzfeldt–Jakob disease A81.0†, F02.1*
  - drugs (residual) – code to F10–F19 with fourth character 0.7
  - epilepsy G40.-†, F02.8*
  - gamma hydroxybutyrate (GHB) F13.71
  - general paralysis of the insane A52.1†, F02.8*
  - hepatolenticular degeneration E83.0†, F02.8*
  - human immunodeficiency virus (HIV) disease B22†, F02.4*
  - Huntington's disease or chorea G10†, F02.2*
  - hypercalcaemia E83.5†, F02.8*
  - hypnotic F13.7-
  - hypothyroidism, acquired E03.-†, F02.8*
    - due to iodine-deficiency E01.-†, F02.8*
  - inhalants F18.7
  - intoxication T65.9†, F02.8*
  - Lewy body disease (cortical) (diffuse) G31.3†, F02.8*
  - multiple
    - aetiologies F03
    - sclerosis G35†, F02.8*
  - neurosyphilis A52.1†, F02.8*
  - niacin deficiency E52†, F02.8*
  - paralysis agitans G20†, F02.3*
  - Parkinson's disease (parkinsonism) G20†, F02.3*
  - pellagra E52†, F02.8*
  - Pick's disease G31.0†, F02.0*
  - polyarteritis nodosa M30.0†, F02.8*
  - sedatives F13.7-
  - systemic lupus erythematosus M32.1†, F02.8*
  - trypanosomiasis, African B56.-†, F02.8*
  - unknown aetiology F03
  - vitamin B_{12} deficiency E53.8†, F02.8*
  - volatile solvents F18.7
- infantile, infantilis F84.3
  - metamphetamine intoxication (acute) F15.01
  - methamphetamine intoxication (acute) F15.01
  - methylamphetamine intoxication (acute) F15.01
  - methylenedioxy methamphetamine (MDMA)
    - intoxication (acute) F15.02
    - withdrawal F15.42
  - multi-infarct F01.1
  - old age F03
  - paralytica, paralytic (syphilitic) A52.1†, F02.8*
    - juvenilis A50.4
  - paretic A52.1†, F02.8*
  - praecox (see also Schizophrenia) F20.9
  - presenile F03
    - Alzheimer's type G30.0†, F00.0*
  - primary degenerative F03
  - progressive, syphilitic A52.1†, F02.8*
  - resulting from HIV disease B22†, F02.4*
  - senile F03
    - with acute confusional state F05.1
    - Alzheimer's type G30.1†, F00.1*
    - depressed or paranoid type F03
  - uraemic N18.5†, F02.8*
  - vascular (of) F01.9
    - acute onset F01.0
    - mixed cortical and subcortical F01.3
    - multi-infarct F01.1
    - predominantly cortical F01.1
    - specified NEC F01.8
    - subcortical F01.2

Delirium, delirious (acute or subacute) (not alcohol- or drug-induced) F05.9
- alcoholic (acute) (tremens) (withdrawal) F10.4
  - chronic F10.6
- due to (secondary to)
  - alcohol
    - intoxication F10.0
    - withdrawal F10.4
  - amphetamine (or related substance) intoxication (acute) F15.09
  - anxiolytic
    - intoxication (acute) F13.0-
    - withdrawal F13.4-
  - cannabis intoxication (acute) F12.0
  - cocaine intoxication (acute) F14.0
  - ecstasy
    - intoxication (acute) F15.02
    - withdrawal F15.42
  - gamma hydroxybutyrate (GHB)
    - intoxication (acute) F13.01
    - withdrawal F13.41
  - general medical condition F05.0
  - hallucinogen
    - intoxication (acute) F16.0-
    - withdrawal F16.4-
  - hypnotic
    - intoxication (acute) F13.0-
    - withdrawal F13.4-
  - inhalant intoxication (acute) F18.0
  - ketamine
    - intoxication (acute) F16.01
    - withdrawal F16.41

Incontinence R32
- anal sphincter R15
- dermatitis L22
- faeces, faecal R15

(*continued next page*)

Appendix 1. (*continued*)

- multiple aetiologies F05.8
- opioid intoxication (acute) F11.0
- phencyclidine (or related substance) intoxication (acute) F19.0
- psychoactive substance NEC
  - intoxication (acute) F19.0
  - withdrawal F19.4
- sedative
  - intoxication (acute) F13.0-
  - withdrawal F13.4-
- unknown aetiology F05.9
- withdrawal state – code to F10–F19 with fourth character 0.4

exhaustion F43.0
hysterical F44.88
mixed origin (dementia and other) F05.8
not superimposed on dementia F05.0
puerperal F05.8
superimposed on dementia F05.1
thyroid E05.5
traumatic (see also Injury/intracranial) S06.9
tremens (alcohol-induced) F10.4
- drug withdrawal — code to F11–F19 with fourth character 0.4

uraemic N19
  - nonorganic origin F98.1

overflow N39.4
psychogenic F45.8
reflex N39.4
stress (female) (male) N39.3
urethral sphincter R32
urge N39.4
urine, urinary R32
  - non-organic origin F98.0
  - postprocedural (late) N99.8
  - specified NEC N39.4
  - stress (female) (male) N39.3

Fall, falling (accidental) W19
Decubitus (ulcer) L89.-
- cervix N86
- stage
  - I L89.0
  - II L89.1
  - III L89.2
  - IV L89.3

Decline (general) (see also Debility) R53
- cognitive, age-associated R41.8

Appendix 2. Medicare Benefits Schedule (MBS) item numbers, grouped by service type

Group A30, 'Medical practitioner telehealth attendance' (Items 2100, 2122, 2125, 2126, 2137, 2138, 2143, 2147, 2179, 2195, 2199, 2220) were excluded from the categorisation because they were not readily categorisable into general practitioner (GP) or specialist attendances, there were very small numbers (n=1 for the 'complex needs' group) and no significant unadjusted difference was observed in hospitalisation rates between the complex needs and comparison groups

MBS category	MBS group	MBS item	Service type group
Category 1: Professional services	A1: GP attendances	3, 4, 20, 23, 24, 35, 36, 37, 43, 44, 47, 51	GP
	A11: Urgent attendances after hours	597, 599	
	A18: GP attendance associated with Practice Incentives Program	2497, 2501, 2503, 2504, 2506, 2507, 2509, 2517,2518, 2521, 2522, 2525, 2526, 2546, 2547, 2552, 2553, 2558, 2559	
	A19: Other non-referred attendance associated with Practice Incentives Program	2598, 2600, 2603, 2606, 2610, 2613, 2616, 2620, 2622, 2624, 2631, 2633, 2635, 2664, 2666, 2668, 2673,2675,2677	
	A20: GP mental health	2700,2701,2712,2713,2715,2717,2721, 2723, 2725,2727	
	A14: Health assessments	701,703,705,707,715	
	A22: GP after hours attendance	5000, 5003, 5010, 5020, 5023, 5028, 5040, 5043, 5049, 5060, 5063, 5067	
	A23: Other non-referred after hours attendance	5200, 5203, 5207, 5208, 5220, 5223, 5227, 5228, 5260, 5263, 5265, 5267	
	A15: GP management plan	721, 723, 729, 731, 732, 735, 739, 743, 747, 750, 758, 820, 822, 823, 825, 826, 828, 830, 832, 834, 835, 837, 838, 855, 857, 858, 861, 864, 866, 871, 872 ,880	
	A17: Domiciliary and residential management reviews	900, 903	
	A2: Other non-referred attendances	52, 53, 54, 57, 58, 59, 60, 65, 92, 93, 95, 96	Specialist/consulting physician
	A3: Specialist attendances	99, 104, 105, 106, 107, 108, 109, 113	
	A4: Consultant physician attendances	110, 112, , 114, 116, 119, 122, 128, 131, 132, 133	
	A5: Prolonged attendances	160, 161, 162, 163, 164	
	A11: Urgent attendances after hours	598, 600	
	A21: Emergency physician attendance	501, 503, 507, 511, 515, 519, 520, 530, 532, 534, 536	
	A8: Consultant psychiatrist attendances	288, 289, 291, 293, 296, 297, 299, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 319, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 342, 344, 346, 348, 350, 352, 353, 355, 356, 357, 358, 359, 361, 364, 366, 367, 369, 370	
	A24: Pain and palliative medicine	2799, 2801, 2806, 2814, 2820, 2824, 2832, 2840, 2946, 2949, 2954, 2958, 2972, 2974, 2978, 2984, 2988, 2992, 2996, 3000, 3003, 3005, 3010, 3014, 3015, 3018, 3023, 3028, 3032, 3040, 3044, 3051, 3055, 3062, 3069, 3074, 3078, 3083, 3088, 3093	
	A28: Geriatric medicine	141, 143, 145, 147, 149	