

Measuring the impact of genetic disease in the WA population

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Introduction

A major shift in the profile of human disease from communicable to non-communicable and genetic disease occurred in the 20th century:

"Genomics will be to the 21st century what infectious disease was to the 20th century.... Genomics crosses into every facet of population health: infectious disease, chronic disease, occupational health, environmental health, as well as maternal and child health." (Gerard et al., 2002¹)

Here, we present preliminary data describing the burden of genetic disease in children and adolescents in Western Australia, as measured by the use of hospital services. Our analysis is confined to single gene and chromosomal disorders where the genetic contribution to disease is clear. This information is vital for policy development and forward planning of health services and resources

Methods

- 296 ICD-10-AM (ICD10)² codes specific to single gene and chromosomal disorders were identified.
- Records for individuals in the hospital morbidity database between 2000 and 2006 who had one of these ICD10 codes in any diagnosis field were extracted from the WA Data Linkage System.
- The data analysis identified: the number of people admitted with the specific ICD10 code (diagnosis) anywhere in their hospital discharge summary; the number of admissions for the principal diagnosis; the number of all other admissions for people identified with the specific diagnosis; the number of same-day admissions versus overnight admissions; the mean length of stay (LOS) of overnight admissions; and the cost of all admissions for a person with a specific diagnosis. Cost was calculated using the year-specific average cost-weight assigned to the diagnosis-related group (DRG) of the admission³. These costs were adjusted to a reference year of 2006–2007 using total health price index deflators⁴.

Results and conclusions

Table 1. The number of patients, admissions and associated hospital costs due to single gene and chromosomal disorders in WA, 2000–2006.

Age group (years)	Total patients	Total admissions	Mean admissions per patient	Total cost (AUD)*	Mean annual cost (AUD)	Mean cost per admission (AUD)
0–1	1009	2676	2.7	19,254,870	2,750,696	7,195
2–4	615	3633	5.9	15,958,263	2,279,752	4,393
5–9	572	2597	4.5	10,473,842	1,496,263	4,033
10–14	551	2726	4.9	11,191,202	1,598,743	4,105
15–19	531	2567	4.8	12,575,912	1,796,559	4,899

* Costs presented are adjusted to the 2006–2007 financial year. NB The average cost of an admission in WA in 2006–7 (all ICD10 codes, all ages) was approximately \$4717. This was calculated from data available from the Australian Institute of Health and Welfare (AIHW)^{5,6}. Age specific WA cost data were not available at the time of preparation of this poster.

References

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Figure 1. Mean length of stay of overnight admissions due to single gene and chromosomal disorders, 2000–2006.

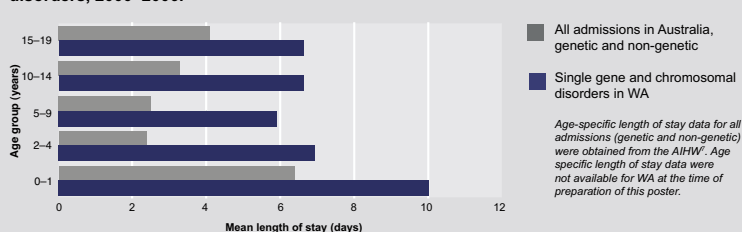


Table 2. Single gene and chromosomal disorders associated with the most admissions in WA, 2000–2006.

Age group (years)	Conditions resulting in the most admissions	Total admissions	Total patients	Of the hospital admissions due to single gene and chromosomal disorders in each age group, the 'top 5' conditions account for:
0–1	1. Down Syndrome (Q90)* 2. Polydactyly (Q69) 3. Cystic Fibrosis (E84) 4. Congenital malformations; multiple systems (Q87) 5. Congenital lens malformations (Q12)	449 243 227 150 109	173 144 72 49 30	44% of admissions 50% of patients 48% of costs
2–4	1. Down Syndrome (Q90) 2. Cystic Fibrosis (E84) 3. Osteogenesis imperfecta (Q780) 4. Phakomatoses (Q85) e.g. Neurofibromatosis, Tuberous sclerosis 5. Thalassaemia (D56)	443 364 198 194 166	62 25 14 21 10	37% of admissions 22% of patients 40% of costs
5–9	1. Down Syndrome (Q90) 2. Osteogenesis imperfecta (Q780) 3. Cystic Fibrosis (E84) 4. Hereditary coagulation defects (D68) e.g. von Willebrand's 5. Congenital malformations; multiple systems (Q87)	374 203 177 141 132	77 13 31 68 38	40% of admissions 22% of patients 44% of costs
10–14	1. Osteogenesis imperfecta (Q780) 2. Cystic Fibrosis (E84) 3. Down Syndrome (Q90) 4. Hereditary coagulation defects (D68) 5. Phakomatoses (Q85)	314 282 264 171 99	19 46 65 60 22	41% of admissions 41% of patients 49% of costs
15–19	1. Cystic Fibrosis (E84) 2. Hereditary coagulation defects (D68) 3. Thalassaemia (D56) 4. Down Syndrome (Q90) 5. Osteogenesis imperfecta (Q780)	628 225 170 132 111	43 96 19 35 3	50% of admissions 42% of patients 59% of costs

*ICD10 code

- The total cost of hospital admissions and mean cost per admission for patients with single gene and chromosomal disorders were relatively stable for patients between five and nineteen years of age.
- The mean number of admissions per patient was relatively stable for patients aged between five and nineteen years of age.
- The mean length of stay for patients with single gene or chromosomal disorders was greater than the mean length of stay for all admissions combined. This supports previously published literature^{8,9}.
- In paediatric patients, the conditions due to single gene and chromosomal disorders that accounted for the largest number of admissions were Cystic fibrosis, Down syndrome, Osteogenesis imperfecta and hereditary coagulation defects.
- The "top five" disorders in each age group were responsible for approximately 40–50% of all admissions and 40–50% of all hospital costs associated with single gene and chromosomal disorders.