

Appendix 6: Comparisons with other data sources

There are several other data sources that cover similar topics to the CHCI collections. A comparison between the results of CHC data and other studies can be helpful for finding the causes of any discrepancies and modifying health policy and health services planning in order to meet the need of the specific population. However, these data sources often differ to the CHC data collection in many critical aspects, which reduces the comparability of the findings. This appendix discusses comparability of data across different sources and presents some related information on prevalence rates derived from other studies or data sources.

A6.1 Limitations in comparing data

Making comparisons across data sets relies on having data that are comparable in relation to a number of factors such as:

- the method of data collection (e.g. data based on a report provided by the child, parent or carer versus data based on a medical examination or a clinical test)
- the definition of medical conditions considered. For example, what specific types of problems were covered by the definition used, the time span of the condition (e.g. current condition versus history of condition) and whether the condition was present at the time of the data collection versus a recurring problem that may or may not have been evident at the time of data collection
- the age of the children in scope
- the geographical area covered (e.g. national, state/territory or regional)
- the timing of collection (e.g. the years in which the data were collected).

In some cases, the available data considered for comparative purposes could not be used because they differed from the CHCI data in a number of ways. A number of examples follow.

The Western Australian Aboriginal and Child Health Survey (WAACHS)

Although the WAACHS (Zubrick et al. 2004) covered a number of similar topics to that of the CHCI data collection (e.g. ear disease, visual impairment and caries), often the definitions used for these medical conditions differed substantially. For example, the WAACHS measure of ear disease refers to *recurring* ear disease, while the CHCI data on ear disease indicate the percentage of children who had ear disease *at the time of the health check*. In addition, the WAACHS data on medical conditions were reported by parents or carers, rather than based on a medical examination or medical test. Furthermore, there are known differences in prevalence rates for some conditions according to state and territory. For example, data from *The National Aboriginal and Torres Strait Islander Health Survey 2004–05* (ABS 2006) show that, across all age groups, rates of asthma are higher in WA than in

the NT. Finally, the WAACHS data were collected in 2004–05 using a sample survey approach. Thus the WAACHS data were not considered comparable with the CHCI data.

Australian Childhood Immunisation Register (ACIR)

Although information on the immunisation status for children aged 0 to 15 years is collected as part of the CHCI, the ACIR presents information on the proportion of children with up-to-date immunisation status at specific ages – namely, 1, 2 and 6 years of age. As well, the criteria used to determine if a child’s immunisation status was up to date differ across the two data collections. The ACIR uses a definition of ‘overdue’ for immunisations not given within 2 months of their due date (ACIR 2007). In contrast, an immunisation that was due was defined in the CHCI as any immunisation not previously given but due by the date of CHC. As a result, the CHCI data on immunisation status shown in Table 2.4 and Appendix 3 are likely to over-state the number of children who would be classed as ‘overdue’ by the ACIR definition.⁶ Because of these differences, the ACIR data are not compared with the data from the CHCI data set.

A6.2 Comparisons made in this appendix

In this appendix, CHCI data presented in Section 2.5 are compared with data from other sources for the following conditions:

- ear disease
- trachoma
- skin sores, scabies and ringworm
- history of rheumatic heart disease
- history of asthma
- anaemia
- stunting, underweight and wasting
- smoker in household.

The outcomes of the comparisons are provided below, along with more detail about the data sources and the comparability of these other data sources with the CHCI data.

Data sources

East Arnhem Regional Healthy Skin Project (EARHSP)

Further context for the CHCI data could be provided by the East Arnhem Regional Healthy Skin Project (EARHSP) data in relation to skin sores, scabies and ringworm. In the EARHSP, children aged 0 to 14 years were screened for skin sores, scabies and ringworm

⁶ The time when vaccines are due is based on age and previous vaccines received, where doses of the same vaccine must be given at particular intervals. CHC teams based immunisation status on age alone. In contrast, the ACIR bases immunisation status on age and period since last vaccine. Thus, in situations where a child was late for their vaccine based on their age, but up to date if their last vaccine was within a certain period, they could be judged as being ‘up to date’ on the ACIR but ‘due’ by the CHC criteria.

over a 3-year period, with treatment and follow-up services also provided (Andrews & Kearns 2007, Andrews 2008). A total of 2,329 children – or 88% of the target population group – received one or more skin assessments over the course of the project with a total of 6,038 skin assessments completed.

Data from the EARHSP showed that among Indigenous children aged 0 to 14 years in East Arnhem, the prevalence rate of five or more skin sores in 2007 was 6% (Andrews 2008). This compared with a CHCI rate at May 2008 of 9% among children of the same age in the Arnhem region but who had four or more skin sores. The observed difference in the prevalence rate is in the expected direction given that the CHCI data relate to four or more skin sores, rather than five or more in the EARHSP data. Data on scabies from the EARHSP indicated that the prevalence rate for scabies (based on the number of skin assessments) for Indigenous children aged 0 to 14 years in East Arnhem over the study period from 2004 to 2007 was 13% (Andrews 2008). This was five percentage points higher than the prevalence rate of 8% observed among children aged 0 to 14 years in the Arnhem region according to the CHCI data. Data from EARHSP indicate that among Indigenous children aged 0 to 14 years in East Arnhem, the prevalence of ringworm (based on the number of skin assessments) was 15% over the study period from 2004 to 2007 (Andrews 2008). Findings from the NTER CHCI indicate that in the Arnhem region, 6% of children aged 0 to 14 years had ringworm.

The prevalence rates from the EARHSP data are based on the number of skin assessments done (not the number of children who were assessed). Specifically, the prevalence rates represent a monthly period prevalence, which excludes subsequent skin assessments for the same child that occurs within 30 days of an earlier assessment (Andrews 2008). Thus, any child can be represented in the EARHSP prevalence rates many times. In contrast, the CHCI prevalence rates are based on the number of children who had a Child Health Check, because only the most recent check for each child is used to calculate rates of health conditions.

The age of the children covered in the two data sources differs: the CHCI data relate to children 0 to 15 years of age, whereas the EARHSP data relate to children aged 0 to 14 years. For the purpose of comparison, the CHCI data were re-analysed and only those aged 0 to 14 years were included.

In order to align the geographical coverage of the two data sets as closely as possible, CHCI results for the Arnhem region (rather than for all of the regions covered by the CHCI) are compared with the results from the EARHSP. In addition, CHC data from July 2007 to May 2008 were used, as reported in the first progress report. In order to match the dates of data collection as closely as possible, EARHSP results for skin sores are available for 2007 only (from January until the completion of the program in August), relating to a total 550 skin assessments. In contrast, EARHSP data for scabies and ringworm were only available for the full study period – namely, September 2004 to August 2007. Thus the period of coverage differs more substantially between the two data sets for the comparisons of scabies and ringworm than it does for the skin sores comparisons.

Growth Assessment and Action program (now incorporated into the Healthy Under 5 Kids program)

The Northern Territory's 2007 Growth Assessment and Action (GAA) program is a monitoring and growth promotion program for children aged 0 to 4 years who live in remote communities of the NT (NT DHCS 2008b). Data from the GAA program in relation

to anaemia, and the three physical growth measures of stunting, underweight and wasting could provide useful context to the CHCI data. The GAA data indicate that in 2007, 25% of children aged 6 months to 4 years were anaemic (NT DHCS 2008b, p. 2). A slightly higher rate of anaemia – 27% – was observed for children aged 0 to 4 years using the CHCI data. Note the age ranges covered by these two data sources differ slightly. Information on the prevalence of stunting is available for NT children aged 0 to 4 years from data collected as part of the GAA program (NT DHCS 2008b). These data indicate that in 2007, 11% of children aged 0 to 4 years were stunted, while the CHCI data indicate 6% of this same age group were stunted. Data on the prevalence of underweight is also available for NT children from the GAA program (NT DHCS 2008b). These data indicates that in 2007, 14% of children aged 0 to 4 years were underweight. The corresponding figure from the CHCI data is 11%. According to data from the 2007 GAA program, 10% of the children aged 0 to 4 years in rural and remote NT communities were identified as wasting. This was consistent with the 10% calculated for children of the same age using the CHCI data.

Although some non-Indigenous children are included within the ambit of the GAA program, the vast majority of children are Indigenous (96% in the 2007 collection⁷). Meanwhile, only Indigenous children are covered by the NTER CHCI.

The geographic areas covered by these two data collections differ slightly. The dates over which the GAA and CHCI data were collected also differ somewhat, with the 2007 GAA data collected between mid October 2006 and mid April 2007 (NT DHCS 2007) and the CHCI data collected from July 2007 to May 2008.

The GAA prevalence rates are calculated based on non-missing data, which contrasts with the approach used for the CHCI data where missing cases are included in the calculations.

In both the GAA and the CHCI data sets, the prevalence of anaemia was based on a blood test and a child was considered to be anaemic when their Hb level was less than 110 g/L. Note that, unlike the physical growth measures, the GAA anaemia data relate to a subset of children – those aged 6 months to 4 years. Because the CHCI data set does not contain exact age in months for all children (because in some versions of the CHCI form, only the age rather than the date of birth was requested), the CHCI analyses could not be re-analysed to exactly match the age range of the GAA data. Instead, the CHCI data that are compared with the GAA data relate to children aged 0 to 4 years. It should also be noted that the geographic areas differ. The GAA data relate to remote communities, whereas the CHCI data, relate to Indigenous children in the NTER prescribed areas, the majority of whom are remote but some urban regional children are also in scope.

To create the physical growth measures, a reference population must be chosen as a comparison point for the growth pattern observed for each child. In order to produce growth measures that are comparable with that of the GAA, the AIHW has made use of the USA Centres for Disease Control and Prevention 2000 growth charts (CDC 2008) for the reference population, as was done by the NT DHCS in their analysis of the GAA data. These growth charts are used by a number of different states and territories across Australia in the creation of physical growth measures (NT DHCS 2007, 2008a).⁸

⁷ Personal communication from Richard Inglis, Health Services Information Branch, NT Department of Health and Community Services, May 2008.

⁸ As detailed in the recent discussion paper released by the NT DHCS (2008a), the NT is considering the future use of the 2006 World Health Organization growth standards rather than the 2000 CDC growth charts.

In addition to the choice of a reference population, the development of physical growth measures relies on a decision about what cut-off points will be used to determine whether a child's growth will be considered adequate or inadequate relative to the 'norm'. For the purposes of the analyses presented in this report, the same cut-off points were used by the NT DHCS and the GAA data (NT DHCS 2007). These cut-offs are as follows:

- stunting: a child was considered to be stunted when their 'height-for-age' score was more than two standard deviations below the mean, relative to the reference population
- underweight: a child was considered to be underweight when their 'weight-for-age' score was more than two standard deviations below the mean, relative to the reference population
- wasting: a child was considered to be wasted when their 'weight-for-height' score was more than two standard deviations below the mean, relative to the reference population.

Healthy School-Age Kids Screening Program

The Healthy School-Age Kids (HSAK) Screening Program is a joint initiative of the NT Department of Health and Community Services and the NT Department of Employment, Education and Training (NT DHCS & NT DEET 2007). The program is for school-aged children in remote areas of the Northern Territory.

Comparisons between data from the Northern Territory's HSAK Screening Program (NT DHCS & NT DEET 2007) and the CHCI could be made in relation to ear disease, trachoma, skin sores, ringworm and anaemia. The HSAK data indicate that 31% of children aged 4 to 5 years who live in remote Indigenous communities in the NT had ear disease (NT DHCS 2008c). The corresponding figure from the CHCI data set for 4 to 5 year olds is similar – 33%. Data from the HSAK program indicate that, in 2007, 10% of Indigenous children aged 4 to 15 years in remote areas of the NT had trachoma (NT DHCS 2008c), while the CHCI data suggest that 7% of children aged 6 to 15 years had trachoma. Note these data are not comparable with CHC data, because the instructions on the CHCI form specifically indicate that children who had been screened for trachoma in 2007 as part of the HSAK program were not to be screened again.

Data from the HSAK program indicate that 16% of children aged 4 to 15 years in remote NT Indigenous communities in 2007 had skin sores (NT DHCS 2008c). This is higher than the prevalence rate of 10% observed in the CHCI data for four or more skin sores for children aged 4 to 15 years. However, given that the CHCI data report on the presence of four or more skin sores (rather than *any* skin sores as in the HSAK data), it would be expected that the CHCI prevalence rate would be lower than that observed using the HSAK data.

Data on ringworm were also collected as part of the HSAK program; these data indicate that, in 2007, 8% of children aged 4 to 15 years in remote NT Aboriginal communities had ringworm (NT DHCS 2008c). This is two percentage points higher than the prevalence rate of 6% observed in the CHCI data for children aged 4 to 15 years. Information on the prevalence of anaemia is also available from the HSAK program. These data indicate that, in 2007, 11% of children aged 4 to 15 years were anaemic (NT DHCS 2008c). This is the same as the CHCI rate of 11% that applies to children of the same ages.

The HSAK data that are discussed in this report were collected in 2007; they relate to all remote Indigenous communities (NT DHCS 2008c). In contrast, the CHCI data, which was collected from July 2007 to May 2008, relate to Indigenous children in the NTER prescribed areas, the majority of which are remote but some urban children in living in town camps are also in scope.

In 2007, HSAK data on ear disease were collected for 170 children aged 4 to 5 years. To align the ages for the two data sets, the CHCI data were re-analysed and a prevalence rate derived for this same age group. For the HSAK collection, ear disease is defined as any abnormality found in at least one ear and includes evidence of acute or chronic infection, as well as other conditions such as wax or foreign bodies in the ear. In contrast, the definition for the CHCI collection is focused specifically on ear disease and does not include other conditions such as wax and foreign bodies in the ear.

The HSAK data on trachoma relate to 2,475 children aged 4 to 15 years, the CHCI data on this health condition were collected for children aged 6 to 15 years and thus the two data sets differ in this regard. More importantly, trachoma screening was not undertaken as part of the CHCs for children who had already been screened for trachoma in 2007 as part of the HSAK program; thus the rates of trachoma from these two data sets are not comparable.

Data on the presence of any skin sores and ringworm were collected for 2,475 children aged 4 to 15 years. The CHCI data on these measures were re-analysed to cover this same age range. The measures of skin sores in the two studies differ: the HSAK program provides information on the prevalence of *any* skin sores, while the measure in the CHCI data relates to the prevalence of four or more skin sores.

Data on anaemia were also collected for 2,475 children in remote Aboriginal communities aged 4 to 15 years as part of the HSAK program. As with the CHCI data, a child was considered to be anaemic when their Hb level was less than 110 g/L.

Morris and colleagues 2001 study on middle ear infection

A comparison between the CHCI data and data based on a sample of Indigenous children from a study by Morris and colleagues on middle ear infection has also been made in past reports. This study found that 91% of children aged 6 to 30 months had some form of middle ear disease (Morris et al. 2005). In the CHC data collection, about 30.3% of children who were aged 0–5 years old had a middle ear condition.

As part of the study by Morris and colleagues, which was undertaken in 2001, the ears of 698 children aged 6 months to 30 months were examined by ear health research officers. The children lived in 29 remote communities in Northern and Central Australia (Morris et al. 2005). This study found that 91% of children who had their ears examined had otitis media, with the rate of perforated ear drums (i.e. severe otitis media) varying considerably between communities and regions.

There are a number of differences between this data collection and the CHCI data collection. In particular, the data collected by Morris and colleagues was part of a research study that was done in 2001 that focused specifically on ear health. Assessments were completed using both tympanometry and pneumatic otoscopy. In contrast, the CHCI ear disease data were collected as part of a general, overall examination of a child's health; these data were collected from July 2007 to May 2008. During the CHCs, assessments of ear health made from July to December 2007 were based on otoscopy results alone; from January 2008 onwards, CHC teams used otoscopes and tympanometers.

Children aged 6 to 30 months were included in the Morris and colleagues study. Because the CHCI database does not have information on age in months for all children, the age ranges of the two studies cannot be aligned; instead, the CHCI data were re-analysed for children aged 1 to 3 years. A total of 1,644 children in this age range are represented in the CHCI database.

The geographical coverage of the two studies differs. Children that were included in the Morris and colleagues study lived in 29 remote communities in the following regions: Darwin Rural, East Arnhem, Katherine and Central Australia. Four of the communities in the Morris and colleagues study were in South Australia and children in the Barkly region and those who lived in out stations were not included. In contrast, the coverage of the CHCI collection included those living in the Barkly region and those living in out stations, but it did not include communities outside the NT.

National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) 2004–05

The NATSIHS, which was conducted by the ABS, collected information on personal and household characteristics for Indigenous persons resident in private dwellings across all states and territories in Australia.

Data on children's conditions from the 2004–05 NATSIHS (ABS 2006) were not comparable with data from the Child Health Checks in most cases because the NATSIHS information relates to long-term conditions (i.e. conditions that had lasted, or were expected to last, for 6 months or more), whereas most of the conditions covered in the CHCI data refer to health conditions that existed at the time of the health check. As well, the information on the children's conditions were reported by parents or carers in the NATSIHS rather than based on the results of a medical examination or clinical test as they were in the CHCI. However, as discussed below, the definitions used and the method of data collection were considered sufficiently similar to allow data from these two sources to be compared for measures of the prevalence of asthma and the presence of a smoker in the household.

Data on the prevalence of asthma were collected in 2004–05 as part of the NATSIHS. These data indicate that 7% of Indigenous children in the NT aged 0 to 14 years had long-term asthma. This is similar to the 6% reported for children the same age in the NT using the CHCI database. Information on the prevalence of children living with a smoker in the household was also collected as part of the 2004–05 NATSIHS. The NATSIHS data indicate that 82% of Indigenous children aged 0 to 14 years in the Northern Territory lived in a household with a regular smoker (AIHW 2007, p. 459). This compares with a rate of 77% for 0 to 14 years olds as observed from the CHCI data.

However, the two data sources differ in a number of other ways. The NATSIHS data were collected in 2004 and 2005 through the use of a sample survey and covered urban, rural and remote regions of Australia. On the other hand, the CHCI data were collected from July 2007 to May 2008 and covered rural and remote areas of the NT in scope of the NTER CHCI.

The NATSIHS data relates to children aged 0 to 14 years. Thus the CHCI data were re-analysed for this subset of children.

Furthermore, the NATSIHS data on asthma were parent/carer-reported data, while the CHCI data on asthma were based on medical records and/or information from parents and carers. No data are provided by the ABS on the rate of long-term asthma among 0 to

14 year olds in the NT. Instead, the ABS report indicates that 14% of Indigenous children in Australia aged 0 to 14 years had long-term asthma (ABS 2006, p. 26). In order to ascertain the relevant rate for the NT, AIHW undertook further analyses of the NATSIHS data.

Top End Rheumatic Heart Disease Register and the Central Australian Rheumatic Heart Disease Register

CHCI data on the prevalence of rheumatic heart disease could be compared with data from the Top End Rheumatic Heart Disease Register and the Central Australian Rheumatic Heart Disease Register. Data from the Top End registry covers the northern part of the NT, including Darwin, East Arnhem, the Katherine region, Alligator, Daly, Finnis and Bathurst-Melville. Data for the NT from the Central Australian registry cover the Barkly and Central Australia regions.

Data from these registers combined indicate that, as at the 31 of December 2005, 0.5% of Indigenous children aged 0 to 14 years had rheumatic heart disease (AIHW 2007, p. 103). In comparison, the CHCI data indicate that 1.1% of Indigenous children aged 0 to 14 years in scope of the NTER CHCI had a history of rheumatic heart disease.

There are a number of differences between these data sources. In particular, the CHCI data set collected information on the history of rheumatic heart disease from health records and/or directly from parents, carers or the children themselves, while the registers collect information from medical providers. As well, the available information from the registers were current as at 31 December 2005, while the CHCI data were collected from July 2007 to May 2008 for children aged 0 to 15 years in scope of having a NTER Child Health Check. Because the data from the registers relate to children aged 0 to 14 years, the CHCI data were re-analysed for this age group for the purpose of the comparisons shown in this report.

Data from the two registers combined indicate that as at 31 December 2005, 99 Indigenous children aged 0 to 14 years were recorded as having rheumatic heart disease. Using estimated resident Indigenous population data for 2001 for the relevant areas, this equates to a rate of rheumatic heart disease of 0.5% (AIHW 2007, p. 103).