

## 3 Follow-up: chart review

### 3.1 Introduction

As described in Chapter 2, a number of Indigenous children who had CHCs were identified as having at least one health condition during their checks. Children with a health condition were sometimes referred to follow-up care, which was provided by the same health care services that operated before the Child Health Care Initiative, namely Aboriginal Community Controlled Health Organisations (ACCHOs), Northern Territory Department of Health and Families (NT DHF) primary health care services (PHC) and various medical specialists. Health care delivered as a result of a referral from a CHC was funded by the Australian Government as part of the CHCI.

A separate process was established as part of the CHCI to monitor whether children received follow-up care for the referrals received at their CHC. This process is known as 'chart review'. It was anticipated that most children who had a CHC would have a chart review to monitor their follow-up status. The chart review process was designed to be conducted in two stages – an 'initial chart review' and an 'exit chart review'.

The purpose of the 'initial chart review' was to:

- ascertain whether the child had been seen at least once for conditions they received a referral for during their CHC
- ascertain whether the child acquired any other conditions since the health check that required follow-up
- indicate any follow-up care still required.

The initial chart review was used to measure the extent to which follow-up through usual care had already been achieved. An action plan was also developed for follow-up care for each child who needed further health care at the time of their initial chart review.

At the end of the follow-up care period, or when a child's course of follow-up care was completed, the primary care workers conducted an 'exit chart review'. The exit chart review served two purposes:

- to determine if the child had been followed up in the period between the initial and exit chart review by specified clinician(s)
- to see if any further follow-up action was required.

Once an initial and exit chart review had been conducted for a child, that chart review was considered 'complete'.

The collection provides a valuable snapshot of the extent of follow-up service delivery for children in prescribed areas of the Northern Territory who had a CHC.

This chapter:

- describes the information collected in the Chart Review data collection and provides some insight into the interpretation and limitations of this collection
- presents the demographics of children who received chart reviews

- discusses outcomes of follow-up care received by children as a result of the referrals and the health conditions identified at their first CHC.

## **3.2 Information about the Chart Review data collection**

Chart reviews were conducted by health workers in the Northern Territory, and all children who had a CHC were eligible for a chart review.

The health workers reviewed and transferred information from the medical charts of children about the management of their health conditions to the chart review forms, which were then sent to the AIHW. Information from these forms was collated by the AIHW into a Chart Review database which is stored and maintained by the AIHW.

Each chart review form contains the following information:

- details about the child: namely the child's Hospital Registration Number (HRN), date of birth, sex and the date of the CHC
- details of the chart review: namely the dates of their initial and exit chart reviews, and the ID of the community where the chart review was conducted
- health conditions identified at the CHC
- type of referrals and health conditions for which these referrals were made
- whether the child had additional health conditions since the CHC that needed to be followed up
- whether the child was seen for their conditions and by whom, before their initial chart review and whether further follow-up was recommended at the time
- whether further follow-up was required.

## **3.3 Data interpretation and limitations**

There are several limitations to the data presented in this chapter that should be taken into account when interpreting the information provided.

All other chapters in this report present data on services conducted up to 30 June 2009. However, for the Chart Review collection no cut-off date was imposed for conducting the chart review. Instead an analysis cut-off date was imposed, where all valid forms (including those relating to chart reviews conducted after 30 June 2009) could be included in the analysis provided they were received by the AIHW on or before 2 November 2009. Extending the date for valid chart reviews enabled this report to present the maximum amount of information on follow-up care provided to children who had a CHC.

The numbers of follow-up services reported here are based on the follow-up services provided to the children when their chart reviews were conducted. Children may have received follow-up care since their chart review.

There is a time lag between the time when health services were provided and the time when information about such services was sent to the health centre where the chart review was conducted. Therefore the health service information available to health

workers at the time a chart review was conducted may have been incomplete. In addition, access to information on certain types of services, such as mental health and social work services, is restricted due to a sensitive nature of such services, thus underestimating the actual service provision.

HRNs were missing from some chart review and CHC forms. Information from these forms could not be used for determining if the child who had a chart review had a valid CHC or any referrals. Therefore, chart review forms and CHC forms with a missing HRN were excluded from the analysis. In other cases, chart review forms were received for children whose CHC forms had not yet been received by the AIHW. These chart review forms were also excluded from the analysis, because consent had not been given to include them in the AIHW database. For these reasons, the number of children reported here as having had chart reviews is lower than those who actually had chart reviews during the period of interest.

On examining the data from complete chart review forms, it was noted that a large number of exit chart reviews were done on the same date as the initial chart reviews. More than 30% of the complete chart review forms that were received reported the same date for the exit chart review as for the initial chart review, and information recorded in the exit chart review was identical to that in the action plan of the initial chart review. This indicated that these exit chart reviews were completed prematurely. As a result, information on initial chart reviews and exit chart reviews can not be analysed separately.

The CHC forms included only information on the type of referral made at CHC, but not the health condition these referrals were made for. Therefore, health conditions for which children were given a referral during CHC can only be identified if these conditions were mentioned on the chart review form. It is not clear whether there were some health conditions for which children were referred to health services that were not mentioned on the chart review forms.

Finally, a considerable amount of information was missing from chart review forms. Some information included on the forms lacked internal consistency and some information was entered in the wrong section of the forms. The AIHW ensured as far as possible that the information entered into the Chart Review database from these forms was correct, but the accuracy of the findings of this chapter will inevitably be affected by these issues.

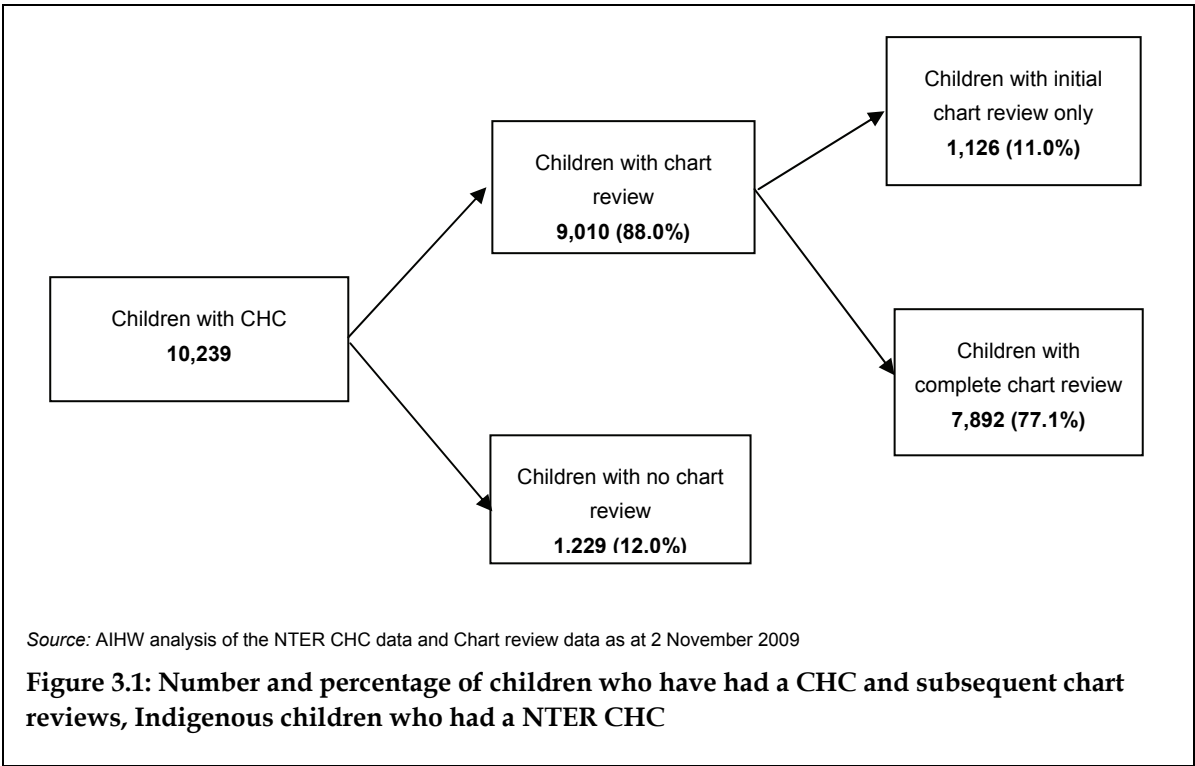
Given these limitations, it is likely that the findings in this chapter understate the number of children who received follow-up services and the number of these services that had been provided by the time chart reviews were conducted.

### **3.4 Chart review forms processed**

A total of 15,085 chart review forms were received and processed by the AIHW as at 2 November 2009. Some forms contained follow-up information for an initial chart review only, while complete chart review forms contained information for both the initial and exit chart reviews. Exit chart review information from a complete form for a child would normally be entered into the same database record as the initial chart review form. However, some complete chart review forms contained different information for the initial chart review than the originally processed initial chart review, and were therefore entered into the database as a different record. Therefore one database record does not

necessarily represent one chart review process. In addition, children with more than one CHC sometimes received an initial and final chart review after each CHC; these were entered as different records. After removing duplicate chart review forms and forms with a missing HRN, there were 9,506 valid chart review records for 9,010 children with valid CHCs.

Of the 10,605 children who had at least one valid CHC, 10,239 children had a valid HRN that could be used to identify their corresponding chart reviews. Among these 10,239 children, 77% had at least one complete chart review (both initial and exit chart review) and 11% had at least one incomplete chart review (an initial chart review only). A small proportion of children (0.1%) had both an incomplete chart review and a complete chart review, each of which were based on different CHCs for the same child. Overall, 88% of the children who had a valid CHC had at least one chart review: either complete or incomplete (Figure 3.1).



### 3.5 Demographic characteristics of children with complete chart reviews

The region, sex and age group of children who had both a Child Health Check and a chart review are shown in Tables 3.1 and 3.2. These characteristics were recorded during the child’s health check.

The Darwin Rural region had the highest proportion of complete chart reviews (89%) for children who had a CHC. This was followed by Central Australia (87%), Arnhem (66%) and Barkly/Katherine (66%) (Table 3.1).

**Table 3.1: Indigenous children who had a NTER CHC and a chart review, by region**

Demographics	Children who had at least one CHC	Children with initial chart review only		Children with complete chart review		Total children with a chart review	
		Number	Per cent <sup>(a)</sup>	Number	Per cent <sup>(a)</sup>	Number	Per cent <sup>(a)</sup>
<b>Region</b>							
Central Australia	2,430	68	2.8	2,120	87.2	2,186	90.0
Arnhem	2,379	656	27.6	1,569	66.0	2,222	93.4
Barkly/ Katherine <sup>(b)</sup>	2,787	312	11.2	1,837	65.9	2,148	77.1
Darwin Rural	2,663	90	3.4	2,372	89.1	2,462	92.5
<b>Total children</b>	<b>10,239</b>	<b>1,126</b>	<b>11.0</b>	<b>7,892</b>	<b>77.1</b>	<b>9,010</b>	<b>88.0</b>

(a) Represents the proportion of children who had a chart review among the total children with at least one valid CHC.

(b) Regional distribution of follow-up data collection reflects the progressive rollout of CHCs and follow-up services which commenced in Central Australia and then began in the Top End before other regions.

Source: AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

Forty-six per cent of children who had initial chart reviews only were aged 0 to 5 years and 41% were aged 6 to 11 years. Forty-five per cent of children who had completed chart reviews were aged 0 to 5 years and 40% children were aged 6 to 11 years. Relatively fewer children aged 12 to 15 years (15%) had had any form of chart review. Slightly more male children (51%) than female children (49%) with CHCs had chart reviews (Table 3.2).

**Table 3.2: Indigenous children who had a NTER CHC and a chart review, by age group and sex**

Demographics	Children with initial chart review only		Children with complete chart reviews		Total children with a chart review	
	Number	Per cent	Number	Per cent	Number	Per cent
<b>Age group</b>						
0–5	519	46.1	3,518	44.6	4,035	44.8
6–11	464	41.2	3,163	40.1	3,623	40.2
12–15 <sup>(a)</sup>	143	12.7	1,243	15.8	1,385	15.4
Missing	0	0.0	<5	0.0	<5	0.0
<b>Total children</b>	<b>1,126</b>	<b>100.0</b>	<b>7,892</b>	<b>100.0</b>	<b>9,010</b>	<b>100.0</b>
<b>Sex</b>						
Male	563	50.0	4,036	51.1	4,598	51.0
Female	563	50.0	3,855	48.8	4,411	49.0
Missing	0	0.0	<5	0.0	<5	0.0
<b>Total children</b>	<b>1,126</b>	<b>100.0</b>	<b>7,892</b>	<b>100.0</b>	<b>9,010</b>	<b>100.0</b>

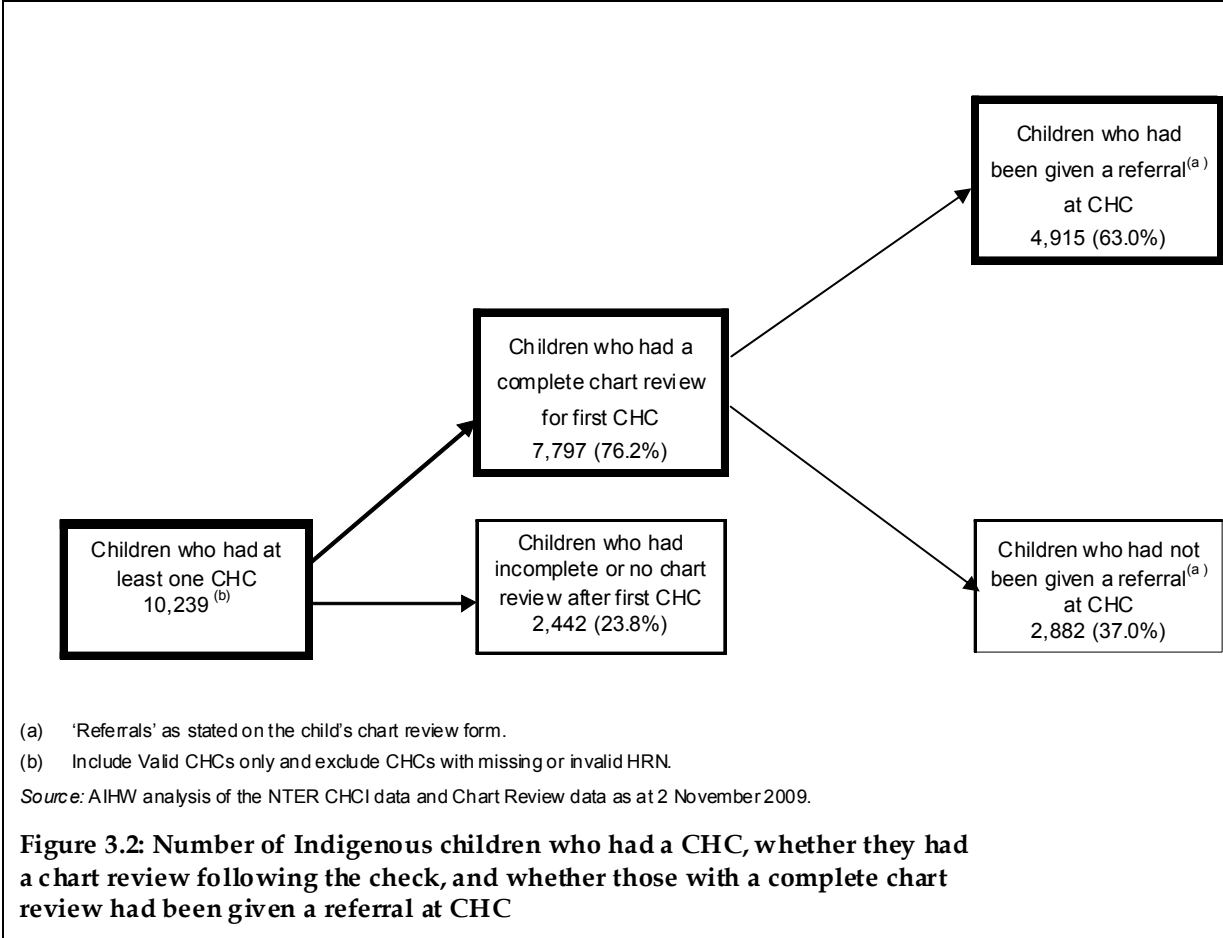
(a) Age at time of the Child Health Check. At the time of chart review, some of these children are likely to be aged 16 years.

Source: AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

### 3.6 Follow-up status of children who received a referral during their CHC

This section presents information on the follow-up status of children who had a CHC and a complete chart review. For children who had more than one CHC, only information on their first valid CHC was used, because most follow-up services were provided in response to referrals made during the child’s initial CHC. Data on referrals to tympanometry or audiometry services and referrals to dental services are not presented in this section, because more complete information can be found in Sections 4.8.1 and 5.8.1 of this report as part of the analysis of the CHCI Audiology and Dental follow-up collections.

Among the 10,239 children who had a CHC, 7,797 (76%) had a complete chart review for their first CHC (Figure 3.2). Because over 30% of the complete chart reviews had the exit chart review conducted at the same time as the initial chart review, the information included in those exit chart reviews was identical to that included in the action plan during the initial chart reviews. For these cases, the information in the action plan in the initial chart review was not used so that double counting of referrals could be avoided.



Over 90% of the children who had a CHC were identified as having at least one health condition at their first CHC. Although many children were treated during their CHC, over three in five were referred to medical professionals or other services for further treatment or follow-up. Of the 7,797 children who had a complete chart review following their first CHC, 4,915 (63%) had at least one referral recorded in their chart review forms for their health conditions (Table 3.3).

Oral health problems were the most common reason for referral, with over 56% of children receiving a referral for this condition (Table 3.3). Other common reasons for referral included ear diseases (41%), anaemia (18%) and skin disease (16%). Some children had more than one health condition that needed to be followed up, while sometimes children were referred to two or more types of clinicians for one health condition.

The follow-up status of these referrals varied considerably by the type of referral. The most frequently followed-up referrals were for primary health care as 81% of children who were referred to primary health had been seen at least once by the time the chart review was conducted. This was followed by referral to cardiologist (63), paediatricians (58%), ENT (57%) and dieticians or nutritionists (42%).

Although a large number of services had been provided to children in need, there was still a large numbers of children who had not been seen by the clinician or the services they were referred to. Over one-third of children who were referred to speech therapists and optometrists or ophthalmologists had not been seen. The proportion of those referred for follow-up who had been seen was lowest for other clinicians (6%), social workers (10%) and speech therapists (24%) (Table 3.4).

**Table 3.3: Children with a complete chart review who received at least one referral at their first CHC, by type of health condition for which the referral was made**

Type of condition	Number <sup>(a)</sup> <sup>(b)</sup>	Per cent <sup>(b)</sup>
Oral health	2,740	55.7
Ear diseases	2,025	41.2
Anaemia	869	17.7
Skin	788	16.0
Cardiac/respiratory	738	15.0
Other conditions	687	14.0
Immunisation due	604	12.3
Growth problem	472	9.6
Investigative tests	330	6.7
Eyes	299	6.1
High BSL	221	4.5
SEWB/mental	195	4.0
Underweight	135	2.7
Overweight	68	1.4
Nutrition	22	0.4
Abdominal	20	0.4
Substance use	17	0.3
<b>Total children with at least one referral</b>	<b>4,915</b>	<b>100.0</b>

(a) Includes only children who had a complete chart review after their first CHC.

(b) Column does not add up to total because one child can be referred for more than one health condition.

Source: AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

There were a number of children who received referrals and who had not been seen at all and yet were indicated on their chart reviews as not needing to be seen. It is not clear how and why the clinicians who conducted the chart review determined that children did not need these services any more. It was possible that the children had recovered from their illness or their situations had changed at the time their chart review was conducted. Over 32% of children who were referred to FACS and housing, dieticians or nutritionists, or mental health services no longer required such services (Table 3.4).

There were a number of children who received referrals at their CHC, but such referrals were missing in their chart reviews. Therefore, it was not possible to determine the follow-up status of their referrals (Table 3.4).



**Table 3.4: Follow-up status of Indigenous children given referrals during NTER Child Health Checks, by type of referral**

Type of referral	Number of children given a referral at their first CHC <sup>(a) (b)</sup>	Seen		Outstanding <sup>(c)</sup>		No longer require follow-up <sup>(d)</sup>		Referral missing <sup>(e)</sup>	
		No.	%	No.	%	No.	%	No.	%
Primary health care	2,678	2,154	80.4	226	8.4	90	3.4	208	7.8
Cardiologist	19	12	63.2	<5	n.a.	<5	n.a.	<5	n.a.
Paediatrician	864	501	58.0	195	22.6	137	15.9	31	3.6
Ear nose and throat specialist	668	380	56.9	178	26.6	90	13.5	20	3.0
Dietician or nutritionist	24	10	41.7	7	29.2	7	29.2	0	0.0
Tests ordered	415	166	40.0	44	10.6	58	14.0	147	35.4
Surgeon	28	10	35.7	5	17.9	<5	n.a.	12	42.9
FACS and housing	59	21	35.6	13	22.0	19	32.2	6	10.2
Mental health services	36	12	33.3	10	27.8	12	33.3	<5	n.a.
Optometrist or ophthalmologist	76	24	31.6	28	36.8	21	27.6	<5	n.a.
Speech therapist	25	6	24.0	11	44.0	7	28.0	<5	n.a.
Social worker	48	5	10.4	7	14.6	8	16.7	28	58.3
Other clinicians	516	32	6.2	17	3.3	7	1.4	460	89.1

(a) Includes only children who had a complete chart review after their first CHC.

(b) Column does not add up to total as one child can have more than one referral.

(c) Refers to children who had not been seen by the services that they were referred to and still needed such services.

(d) Refers to children who had not been seen by the services that they were referred to, but who no longer required such services.

(e) Refers to children who received referrals at the CHC, but for whom no referrals were mentioned in their chart reviews.

*Note:* Please refer to Chapter 4 and 5 of this report for information on the follow-up status of children referred to audiometry and dental services.

*Source:* AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

## 3.7 Additional referrals and health conditions needing follow-up

One of the purposes of initial chart reviews was to identify whether children had any additional conditions which had not been recorded during their CHC, and then to monitor their follow-up status at their exit chart review. Chart reviews can also be used to provide missing information about number and type of referrals for children whose CHC was recorded on non-standard forms.

This section describes these additional referrals made at the chart review and their follow-up status, and incorporates those referrals found during chart reviews for CHCs on non-standard forms. As in the previous section, data on referrals to tympanometry or audiometry services and dental services are not presented because more complete information can be found in Chapters 4 and 5 of this report.

Among the 7,797 children who had a complete chart review for their first CHC, 3,578 (46%) children had an additional referral at their chart review. Ear disease was the most common reason for these referrals, with about 30% of children receiving an additional referral for this condition. Other common reasons for additional referral were oral health (21%), skin problems (12%) and anaemia (11%) (Table 3.5). Some children had more than one additional health condition that needed to be followed up.

**Table 3.5: Children with additional referrals at chart review by type of health condition**

Type of condition	Number <sup>(a)</sup> <sup>(b)</sup>	Per cent
Ear disease	1,072	30.0
Oral health	750	21.0
Skin condition	430	12.0
Anaemia	389	10.9
Immunisation due	304	8.5
Eye disease	299	8.4
Growth problem	281	7.9
Cardiac/respiratory abnormality	197	5.5
SEWB/mental	184	5.1
Underweight	108	3.0
Investigative tests	87	2.4
Nutrition	38	1.1
High BSL	31	0.9
Substance use	11	0.3
Overweight	10	0.3
Abdominal	10	0.3
Other conditions <sup>(c)</sup>	1,573	44.0
<b>Total children</b>	<b>3,578</b>	<b>100.0</b>

(a) Includes only children who had a complete chart review following their first CHC.

(b) Column does not add up to total as one child can be referred for more than one health condition.

(c) Include all health conditions except the health conditions listed above.

Source: AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

A high proportion of children given an additional referral to services or practitioners had received follow-up care at the time of the exit chart review. The highest proportion of those who received follow-up by having been seen at least once, were those referred to a surgeon (88%) or to primary health care (87%); followed by those who had a test ordered (72%), referrals to other clinicians (71%), dieticians or nutritionists (70%), paediatrician (69%) and ENT (68%). A relatively low proportion of children who had an additional referral had been seen by an optometrist or ophthalmologist (45%), FACS (31%), a social worker (27%) a speech therapist (21%) or housing (0%) (Table 3.6).

**Table 3.6: Follow-up status of Indigenous children given additional referrals during chart review, by referral**

Type of referral	Number of children given an additional referral <sup>(a) (b)</sup>	Seen		Outstanding <sup>(c)</sup>		No longer require follow-up <sup>(d)</sup>	
		No.	Per cent	No.	Per cent	No.	Per cent
Surgeon	33	29	87.9	<5	6.1	<5	6.1
Primary health care	1,942	1,695	87.3	174	9.0	73	3.8
Tests ordered	82	59	72.0	12	14.6	11	13.4
Other clinicians	294	208	70.7	51	17.3	35	11.9
Dietician or nutritionist	158	110	69.6	33	20.9	15	9.5
Paediatrician	397	272	68.5	67	16.9	58	14.6
Ear nose and throat specialist	825	559	67.8	170	20.6	96	11.6
Urologist/renal physician	15	10	66.7	<5	6.7	<5	26.7
Physiotherapist	12	8	66.7	<5	16.7	<5	16.7
Cardiologist	119	72	60.5	22	18.5	25	21.0
Mental health services	36	20	55.6	9	25.0	7	19.4
Optometrist or ophthalmologist	94	42	44.7	29	30.9	23	24.5
FACS	72	22	30.6	17	23.6	33	45.8
Social worker	30	8	26.7	14	46.7	8	26.7
Speech therapist	43	9	20.9	19	44.2	15	34.9
Housing	10	0	0.0	7	70.0	<5	30.0

(a) Includes only children who had a complete chart review following their first CHC.

(b) Column does not add up to total as one child can be referred for more than one health condition.

(c) Refers to children have not been seen by the services that they were referred to and still need such services.

(d) Refers to children have not been seen by the services that they were referred to, but they are no longer requiring such services

*Note:* Please refer to Chapters 4 and 5 of this report for information on the follow-up status of children referred to audiometry and dental services.

*Source:* AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

## 3.8 Further action required

There were 2,820 children who still had conditions requiring further action at exit chart review, representing 36% of children who had a complete chart review for their first CHC. Among children requiring further action, 66% needed dental services, 54% needed to be followed up by primary care, and 47% needed to be seen by either an ENT specialist or an audiologist (Table 3.7).

The fact that many children required continuing follow-up at the point of their exit chart review is not surprising. Many of the conditions being treated are chronic in nature and require continuing attention over time regardless of the intensity of care that may have been available through the additional NTER-funded follow-up services.

**Table 3.7: Children with further action required at exit chart review, by type of referral**

Type of referral	Number	Per cent
Dental	1,846	65.5
Primary health care	1,531	54.3
Tympanometry and audiometry	583	20.7
Ear, nose and throat specialist	755	26.8
Paediatrician	474	16.8
Tests ordered	112	4.0
Optometrist or ophthalmologist	85	3.0
Other clinician	183	6.5
Dietician or nutritionist	101	3.6
Speech therapist	33	1.2
Cardiologist	64	2.3
FACS	33	1.2
Social worker	27	1.0
Mental health services	32	1.1
Housing	16	0.6
Surgeon	17	0.6
Physiotherapist	10	0.4
Occupational therapist	<5	0.1
Urologist/renal physician	<5	0.1
<b>Total number of children who require further action <sup>(a)</sup></b>	<b>2,820</b>	<b>100.0</b>

(a) Column does not add up to total because one child can be referred for more than one health condition.

Source: AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

### 3.9 Time elapsed

The date of a child's chart review indicates when Australian Government NTER-funded follow-up commenced in the primary care setting for that child. Before this, follow-up occurred through the usual care processes. The following tables show the data on the time that elapsed between CHCs and corresponding initial chart reviews. Two points should be noted when interpreting data on time elapsed between CHCs and initial chart reviews.

- The date of the chart review was missing, or outside the valid range of chart review dates in 295 records. In addition, the date of chart review was as same as with the date of the CHC in 969 chart review records. These records were excluded from the analysis when calculating time elapsed between CHC and initial chart review.
- The time elapsed between the initial chart review and the exit chart review was not calculated because more than 30% of the exit chart reviews were completed on the same date as their corresponding initial chart review.

Approximately 13% of the chart reviews had an initial chart review within three months of their CHC (Table 3.8). About 30% of the children had their initial chart review 3 to 9 months after the CHC. For 57%, chart reviews occurred 9 months or more after the CHC

(Table 3.8). The mean elapsed time between the CHC and initial chart review was 286 days, while the median elapsed time was 292 days.

**Table 3.8: Time elapsed between CHC and initial chart review**

Time lapsed	Number of chart review form <sup>(a)</sup>	Per cent
<3 months	1,025	13.4
3 to <6 months	1,087	14.2
6 to <9 months	1,198	15.6
9 months or longer	4,348	56.8
<b>Total chart review forms</b>	<b>7,658</b>	<b>100.0</b>

(a) Excludes records with missing and invalid date of CHC or initial chart review and records that the date of chart review was as same as with the date of the CHC.

Source: AIHW analysis of the NTER CHCI data and Chart Review data as at 2 November 2009.

## 3.10 Summary

During the follow-up phase of the CHCI, chart reviews were undertaken by clinicians providing children with follow-up care. These chart reviews involved assessment of the health records of children who had a CHC to ascertain whether the children had the follow-up care that had been recommended for them during the CHC.

About 88% (9,010 out of 10,239) of children who had a valid health check and had a valid HRN went on to have a chart review. The percentage of children who had a chart review by 2 November 2009 was nearly double that reported in December 2008 (46%).

The data from the chart reviews showed that:

- There were 7,797 (76%) children who had a complete chart review for their first CHC.
- Of those who had a complete chart review 4,915 (63%) had at least one referral recorded in their chart review forms.
- The health condition for which the greatest number of referrals was given was oral health (2,740 or 56% of all referrals).
- The type of service with the greatest number of completed referrals was primary health care (2,678, or 80% of the referrals).
- Of those who had a complete chart review, 3,578 (46%) children had an additional referral made at their chart review.
- The health conditions for which the largest number of additional referrals were given were ear disease (1,072 or 30%) followed by oral health (750 or 21%).
- The highest proportion of those who received follow-up by having been seen at least once, were those referred to a surgeon (88%) or to primary health care (87%).
- There were 2,820 children who still had conditions that required further action when their exit chart review was conducted, representing 36% of children who had a complete chart review for their first CHC.

- The mean time elapsed between a CHC and an initial chart review was 286 days. Fifty-seven percent of these children had a lag of 9 months or longer between their CHC and their initial chart review.