

22 March 2010

Information for Ministry of Health's 24 March briefing to the Health Select Committee for the inquiry into immunisation completion rates

Although the Ministry of Health was not asked for a specific briefing document the Committee requested information about the National Immunisation Register, and immunisation coverage rates.

The Ministry of Health has provided the following information to support this request and to provide further information about immunisation in New Zealand.

1. The current National Immunisation Schedule
2. The National Immunisation Register
 - purpose, history, system overview.
3. Immunisation coverage data
 - current national and district health board data for 2 year old children as at 12 March 2010
 - New Zealand's immunisation coverage over time
 - immunisation timeliness
 - how New Zealand's coverage compares to other countries by specific vaccine
4. Disease burden
 - New Zealand's disease numbers for *Haemophilus influenzae* type b (Hib), measles, mumps, rubella and whooping cough (pertussis) and international comparisons.
5. Immunisation Handbook 2006
 - the Immunisation Handbook is the Ministry's authoritative guide on immunisation. It contains all of the information that a health professional may need to safely and confidently deliver the Ministry-funded National Immunisation Schedule vaccines along with non-funded vaccines.
6. Childhood Immunisation brochure
 - an example of a brochure available for parents/caregivers.
7. Human papillomavirus vaccine consent form
 - consent form for school-based HPV immunisations. This information has been translated into 13 languages and is available as an accompanying insert.

1. The National Immunisation Schedule

The current immunisation schedule is shown in Table 1 below. This schedule was introduced in 2008. More information on the history of the immunisation schedule can be found in Appendix 1 of the *Immunisation Handbook 2006*.

Table 1 – National Immunisation Schedule

Age	Diseases protected against
Birth	<ul style="list-style-type: none"> ○ BCG for babies susceptible to tuberculosis ○ Hepatitis B for babies of hepatitis B positive mothers
6 weeks	<ul style="list-style-type: none"> ○ Diphtheria, tetanus, whooping cough, polio, hepatitis B, <i>Haemophilus influenzae</i> type b (one injection) ○ Pneumococcal (one injection)
3 months	<ul style="list-style-type: none"> ○ Diphtheria, tetanus, whooping cough, polio, hepatitis B, <i>Haemophilus influenzae</i> type b (one injection) ○ Pneumococcal (one injection)
5 months	<ul style="list-style-type: none"> ○ Diphtheria, tetanus, whooping cough, polio, hepatitis B, <i>Haemophilus influenzae</i> type b (one injection) ○ Pneumococcal (one injection)
15 months	<ul style="list-style-type: none"> ○ <i>Haemophilus influenzae</i> type b (one injection) ○ Pneumococcal (one injection) ○ Measles, mumps, rubella (one injection)
4 years	<ul style="list-style-type: none"> ○ Diphtheria, tetanus, whooping cough, polio (one injection) ○ Measles, mumps, rubella (one injection)
11 years	<ul style="list-style-type: none"> ○ Diphtheria, tetanus, whooping cough (one injection)
12 years (girls only)	<ul style="list-style-type: none"> ○ Human papillomavirus (three injections over six months)
45 years	<ul style="list-style-type: none"> ○ Tetanus diphtheria (one injection)
65 years	<ul style="list-style-type: none"> ○ Tetanus diphtheria (one injection) ○ Influenza (one injection) – also offered to people of all ages with certain chronic conditions

1. The National Immunisation Register

The National Immunisation Register (NIR) is a computerised information system developed to hold immunisation details of New Zealand children.

The register enables authorised health professionals to quickly and easily find out what vaccines a child has been given (this includes children whose family has shifted or changed healthcare providers). Primary care providers can follow up on individual children and check their immunisation status in real time. This helps to make sure immunisations are given at the appropriate time.

The register also provides an accurate record of immunisation coverage rates – regionally and nationally. This enables programme planning to target populations with the lowest immunisation rates. The register is also used to track progress towards the national target of 95% of two year olds fully immunised by July 2012.

a. History of the National Immunisation Register

The development and rollout of the National Immunisation Register was separated into three main parts – a primary care element, schools based system, and a birth cohort and maternity systems element. The first two elements were needed to support the start of the MeNZB meningococcal campaign. The birth cohort and maternity systems element supports the ongoing child immunisation programmes.

Implementation was phased throughout the country, starting in the Auckland region in mid-2004 and finishing in Nelson/Marlborough in December 2005.

Information is collected for children born after the date the register was rolled out in their DHB - at present children up to four and five years old have all their vaccination details recorded on the register. The register also records MeNZB and human papillomavirus (HPV) vaccinations for older children.

b. Who uses the National Immunisation Register?

The register receives and sends information to several other information systems: multiple maternity systems (to register babies), the five practice management systems used in general practices, and the School Based Vaccination System used by public health nursing for school programmes.

Maternity - Most registrations come from maternity data sent after the baby is discharged from the maternity facility.

Primary care - providers send immunisation event data at the time of immunisation for each registered individual, in addition to demographic and vaccinator information. This is usually done electronically, through the provider's practice management system which also sends a message to the Ministry's claim centre so that the provider is paid for that immunisation event.

Paper-based systems are also available. Authorised providers can also look up an individual's immunisation status.

School based vaccinators – upload data from school-based vaccinations for human papillomavirus to the register.

District health boards – each DHB has a local NIR administrator funded by the Ministry of Health who monitors immunisation coverage for programme planning, liaises with primary care providers and assists with data quality.

Ministry of Health - monitors immunisation coverage to plan programmes and identify issues, assist with data quality, publishes national and DHB data each quarter to monitor progress towards the immunisation coverage target.

c. Security and privacy of information

The management of health information is governed by the Health Information Privacy Code 1994, which forms the basis of the National Immunisation Register's privacy policy.

The individual (or their parent or guardian) must be informed about the register and be aware that information about them is being recorded and for what purpose. Individuals (or their parents or guardians) can choose not to have immunisation data recorded, even if they still have the vaccine(s).

2. Immunisation Coverage Data

a. Immunisation coverage data by district health board for two-year-old children (3-month cohort)

National immunisation coverage for two-year old children has just reached 85%. The immunisation health target is 95% of two-year olds fully immunised by 2012.

The graphs and tables below show the percentage of fully immunised two-year old children by district health board (DHB), ethnicity and level of deprivation as at 12 March 2010. Only those children who turned two years of age in the previous three months are included, which is why in some districts the number of eligible children is low.

Figure 1 – Immunisation coverage by district health board for 2-year-old children

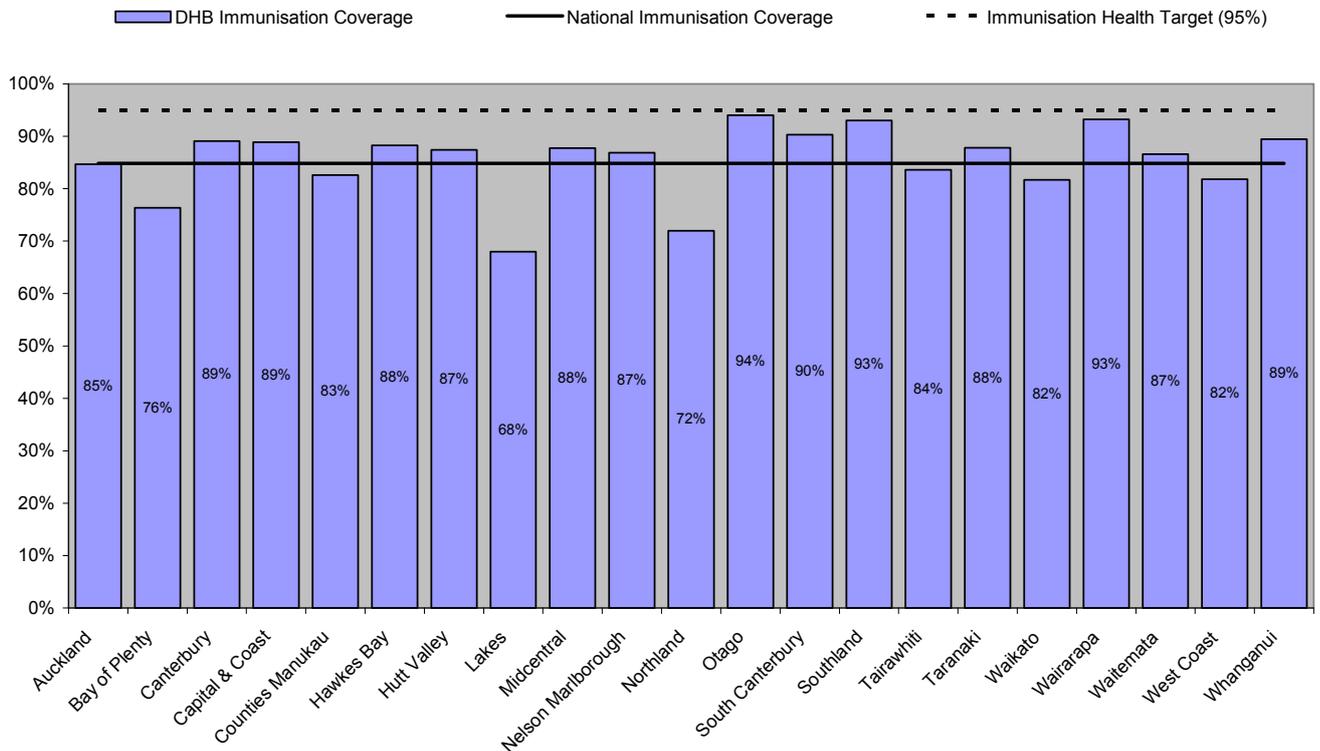


Table 2 - Immunisation coverage by district health board and prioritised ethnicity for 2-year old children

DHB Area	Total			NZE			Maori			Pacific			Asian			Other		
	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%
Auckland	1,604	1,358	85%	403	349	76%	190	149	78%	316	265	84%	366	327	89%	329	268	81%
Bay of Plenty	757	578	76%	309	252	78%	313	223	71%	16	12	75%	36	33	92%	83	58	70%
Canterbury	1,633	1,455	89%	917	838	87%	263	225	86%	70	65	93%	119	107	90%	264	220	83%
Capital & Coast	997	886	89%	441	411	91%	182	153	84%	107	93	87%	108	99	92%	159	130	82%
Counties Manukau	2,209	1,825	83%	296	249	80%	615	442	72%	739	632	86%	307	285	93%	252	217	86%
Hawkes Bay	606	535	88%	269	240	85%	242	210	87%	28	26	93%	22	22	100%	45	37	82%
Hutt Valley	523	457	87%	193	171	88%	136	118	87%	55	47	85%	53	49	92%	86	72	84%
Lakes	425	289	68%	138	110	72%	223	126	57%	n/s	n/s	80%	18	17	94%	41	32	78%
Midcentral	595	522	88%	286	258	88%	180	157	87%	30	23	77%	31	26	84%	68	58	85%
Nelson Marlborough	471	409	87%	289	259	87%	78	65	83%	n/s	n/s	100%	19	16	84%	79	63	80%
Northland	557	401	72%	175	134	74%	308	213	69%	10	n/s	50%	15	14	93%	49	35	71%
Otago	555	522	94%	382	359	91%	79	76	96%	25	23	92%	16	16	100%	53	48	91%
South Canterbury	165	149	90%	124	116	90%	16	14	88%	n/s	n/s	100%	n/s	n/s	100%	20	14	70%
Southland	401	373	93%	240	228	82%	97	89	92%	11	n/s	73%	17	16	94%	36	32	89%
Tairāwhiti	220	184	84%	46	42	89%	156	129	83%	n/s	n/s	100%	n/s	n/s	100%	12	n/s	58%
Taranaki	411	361	88%	240	211	84%	121	105	87%	10	n/s	90%	n/s	n/s	89%	31	28	90%
Waikato	1,473	1,203	82%	670	566	82%	515	392	76%	46	38	83%	78	77	99%	164	130	79%
Wairarapa	133	124	93%	68	66	91%	46	43	93%	n/s	n/s	100%	n/s	n/s	100%	12	n/s	67%
Waitemata	1,917	1,660	87%	672	560	77%	310	250	81%	225	204	91%	275	260	95%	435	386	89%
West Coast	110	90	82%	67	58	78%	22	20	91%	n/s	n/s	100%	n/s	n/s	100%	15	n/s	40%
Whanganui	228	204	89%	95	88	87%	93	80	86%	n/s	n/s	89%	n/s	n/s	100%	30	27	90%
National	16,009	13,585	85%	6,327	5,565	83%	4,191	3,279	78%	1,722	1,480	86%	1,503	1,385	92%	2,266	1,876	83%

The orange shaded area shows districts with immunisation coverage below the national average.

Table 3 - Immunisation coverage by district health board and level of deprivation for 2-year old children

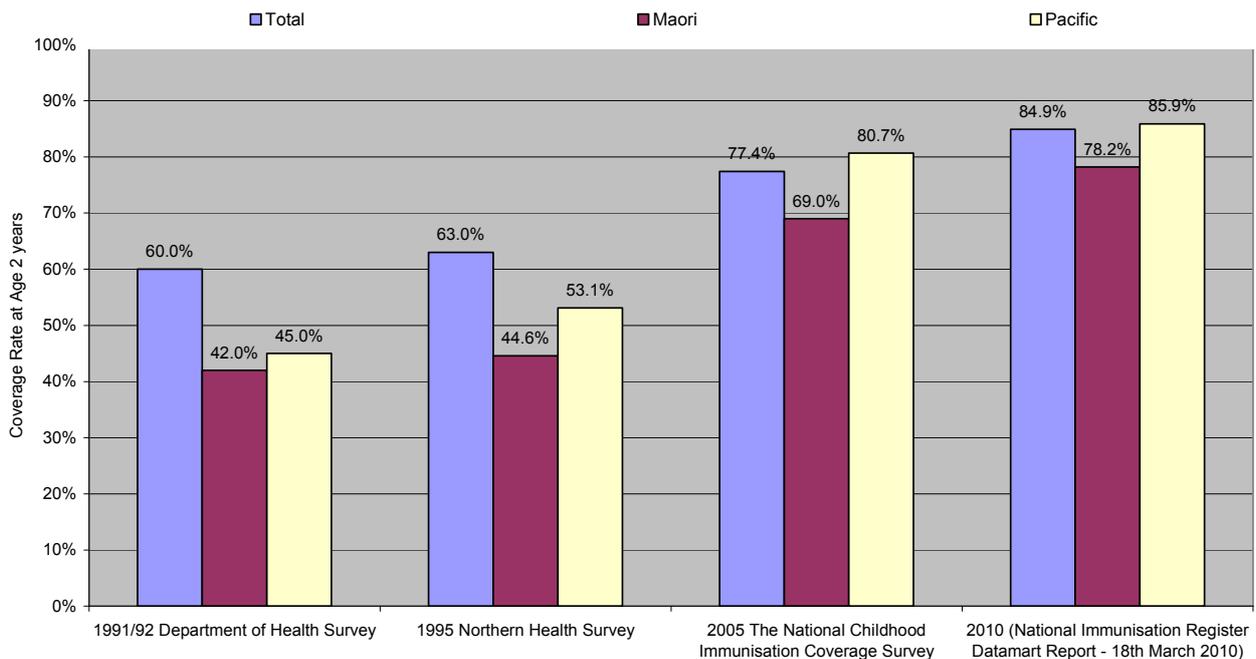
DHB Area	Dep 1-2			Dep 3-4			Dep 5-6			Dep 7-8			Dep 9-10			Dep Unavailable		
	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%	No. Eligible	Fully Immunised for Age	%
Auckland	251	214	85%	245	211	86%	262	221	84%	329	286	87%	381	314	82%	136	112	82%
Bay of Plenty	52	36	69%	96	80	83%	120	96	80%	165	122	74%	203	152	75%	121	92	76%
Canterbury	342	323	94%	313	279	89%	370	309	84%	280	247	88%	191	168	88%	137	129	94%
Capital & Coast	284	267	94%	213	192	90%	154	136	88%	86	73	85%	181	150	83%	79	68	86%
Counties Manukau	197	166	84%	221	190	86%	198	168	85%	314	273	87%	827	660	80%	452	368	81%
Hawkes Bay	72	59	82%	54	44	81%	118	106	90%	129	115	89%	208	189	91%	25	22	88%
Hutt Valley	114	104	91%	74	62	84%	97	87	90%	104	93	89%	105	90	86%	29	21	72%
Lakes	40	30	75%	41	37	90%	57	34	60%	64	44	69%	150	89	59%	73	55	75%
Midcentral	71	61	86%	101	89	88%	96	84	88%	127	110	87%	124	109	88%	76	69	91%
Nelson Marlborough	56	48	86%	81	73	90%	111	98	88%	83	68	82%	45	40	89%	95	82	86%
Northland	22	18	82%	59	43	73%	104	78	75%	106	78	74%	197	137	70%	69	47	68%
Otago	99	95	96%	111	106	95%	129	119	92%	105	99	94%	63	62	98%	48	41	85%
South Canterbury	24	21	88%	33	31	94%	40	39	98%	30	27	90%	17	16	94%	21	15	71%
Southland	113	103	91%	82	79	96%	75	70	93%	60	57	95%	46	43	93%	25	21	84%
Tairāwhiti	17	13	76%	10	n/s	90%	27	27	100%	27	24	89%	126	99	79%	13	12	92%
Taranaki	55	49	89%	70	60	86%	85	76	89%	87	76	87%	79	69	87%	35	31	89%
Waikato	189	158	84%	227	202	89%	211	171	81%	265	210	79%	382	304	80%	199	158	79%
Wairarapa	12	12	100%	12	12	100%	24	22	92%	57	52	91%	26	24	92%	n/s	n/s	100%
Waitemata	295	249	84%	339	294	87%	378	326	86%	357	311	87%	158	140	89%	390	340	87%
West Coast	n/s	n/s	83%	20	19	95%	24	23	96%	43	29	67%	17	14	82%	n/s	n/s	-
Whanganui	16	16	100%	22	17	77%	40	37	93%	48	39	81%	100	93	93%	n/s	n/s	100%
National	2,330	2,047	88%	2,426	2,129	88%	2,723	2,327	85%	2,869	2,433	85%	3,633	2,962	82%	2,028	1,687	83%

The orange shaded area shows districts with immunisation coverage below the national average.

b. New Zealand’s immunisation coverage over time

Figure 2 shows New Zealand’s immunisation coverage for two-year old children by ethnicity over time. Data for this graph is sourced from national and regional coverage surveys and the National Immunisation Register.

Figure 2 – immunisation coverage for 2-year old children by ethnicity (1991-2010)



Figures for Māori and Pacific peoples were not presented in the 1992 report but were presented in subsequent articles without confidence intervals because the survey was not designed to provide good estimates for ethnic coverage levels. Caution should therefore be exercised when using these figures.

c. Immunisation timeliness

One measure of immunisation timeliness is the number of children who are fully immunised at each of the six-monthly milestone ages.

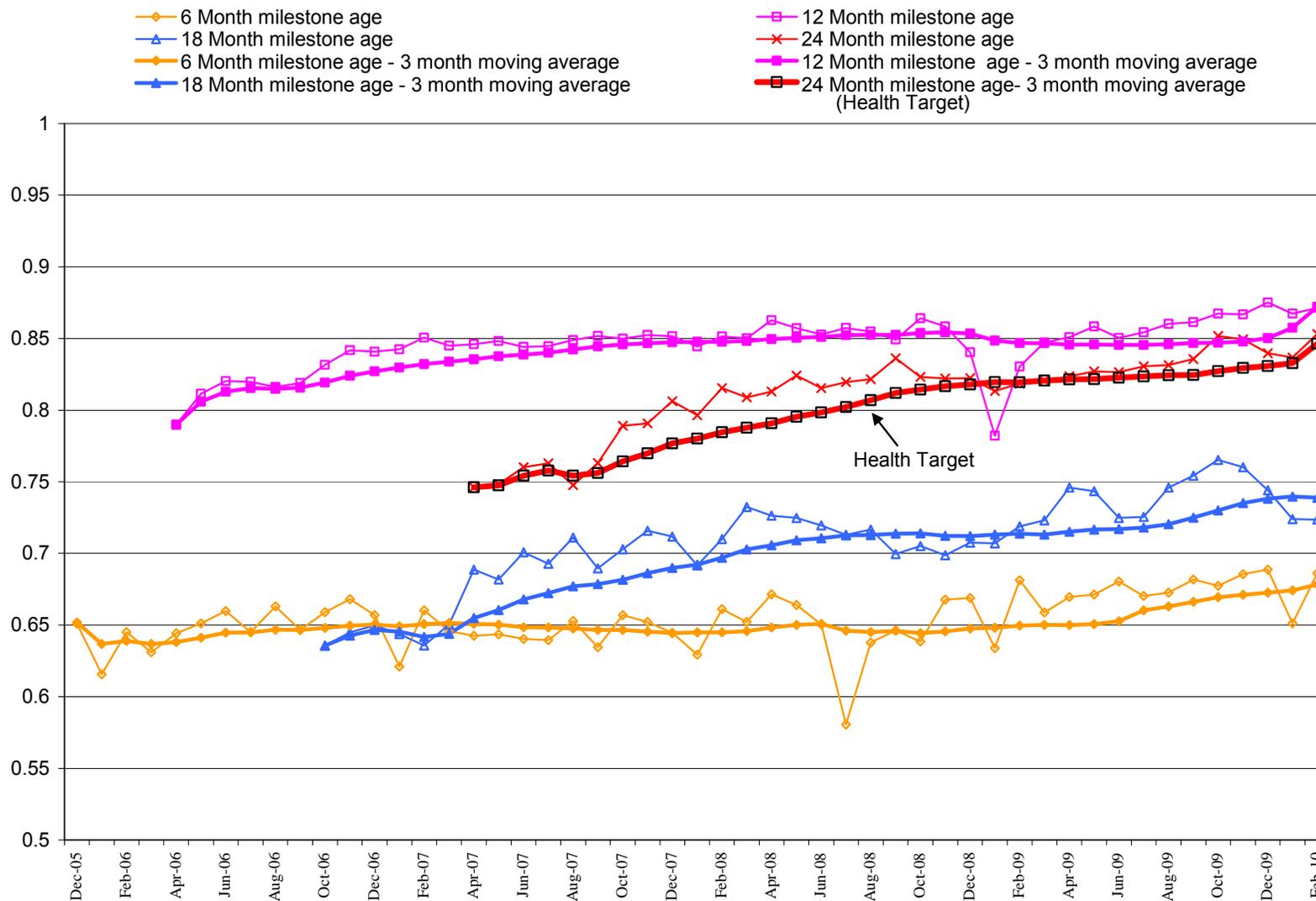
Milestone Age	Immunisations included in measurement
Six months	6 weeks, 3 months, 5 months
12 months	as above
18 months	as above PLUS 15 months
24 months	as above

Immunisation coverage increases between six and 12 months as no immunisations are scheduled during this time and children have time to catch up. Coverage usually decreases slightly at 18 months due to the 15 month immunisation event. Coverage increases again at 24 months as no further immunisations are scheduled and children have time to catch up.

Childhood immunisation coverage rates

Monthly results and 3-monthly moving averages

December 2005 to February 2010



d. How New Zealand's immunisation coverage compares internationally

Table 5 – WHO/UNICEF immunisation coverage estimates by specific vaccine for OECD countries (2008)

OECD Countries	DTP1	Rank DTP1	DTP3	Rank DTP3	HepB3	Rank HepB3	Hib3	Rank Hib3	MCV	Rank MCV	Pol3	Rank Pol3
Australia	97	19	92	25	94	10	94	15	94	17	92	24
Austria	94	28	83	29	83	17	83	26	83	30	83	29
Belgium	99	1	99	1	98	3	98	4	93	19	99	1
Canada	97	19	94	21	14	19	94	15	94	17	90	27
Czech Republic	98	13	99	1	99	1	99	1	97	6	99	1
Denmark	97	19	75	30	-	-	75	28	89	24	75	30
Finland	99	1	99	1	-	-	98	4	97	6	97	12
France	98	13	98	9	29	18	87	24	87	26	98	8
Germany	98	13	90	27	90	15	93	18	95	16	96	15
Greece	99	1	99	1	95	9	83	26	99	1	99	1
Hungary	99	1	99	1	-	-	99	1	99	1	99	1
Iceland	94	28	98	9	-	-	98	4	96	11	98	8
Ireland	97	19	93	24	-	-	93	18	89	24	93	22
Italy	98	13	96	17	96	8	96	13	91	23	96	15
Japan	99	1	98	9	-	-	-	-	97	6	95	19
Luxembourg	99	1	99	1	94	10	98	4	96	11	99	1
Mexico	99	1	98	9	98	3	98	4	96	11	98	8
Netherlands	98	13	97	14	-	-	97	10	96	11	96	15
New Zealand	91	30	89	28	90	15	86	25	86	28	89	28
Norway	97	19	94	21	-	-	94	15	93	19	94	21
Poland	99	1	99	1	98	3	88	23	98	4	99	1
Portugal	99	1	97	14	97	6	97	10	97	6	97	12
Republic of Korea	95	27	94	21	94	10	-	-	92	21	92	24
Slovakia	99	1	99	1	99	1	99	1	99	1	99	1
Spain	98	13	97	14	97	6	97	10	98	4	97	12
Sweden	99	1	98	9	-	-	98	4	96	11	98	8
Switzerland	97	19	95	20	-	-	93	18	87	26	95	19
Turkey	97	19	96	17	92	14	96	13	97	6	96	15
Great Britain and Northern Ireland	97	19	92	25	-	-	92	22	86	28	92	24
United States of America	99	1	96	17	93	13	93	18	92	21	93	22
Number of Countries		30		30		19		28		30		30
Simple mean	98		95		87		93		94		95	
Median	98		97		94		95		96		96	

DTP1 and 3 – first or third dose of diphtheria, tetanus and pertussis (whooping cough) containing vaccine
HepB3 – third dose of hepatitis B containing vaccine
Pol3 – third dose of polio containing vaccine

Hib3 – third dose of *Haemophilus influenzae* containing vaccine
MCV – measles containing vaccine

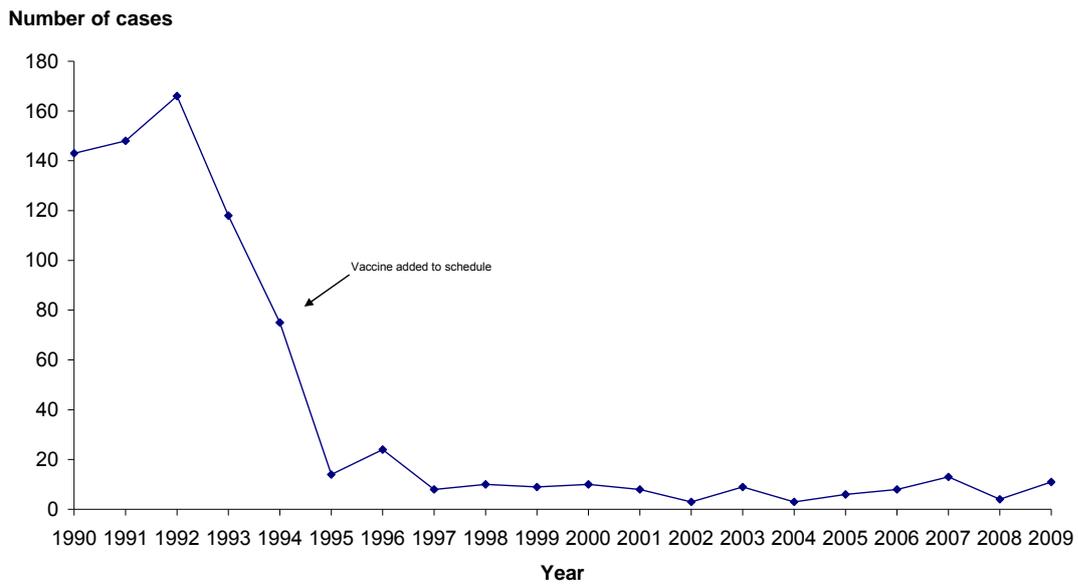
3. Disease

a. *Haemophilus influenzae* type b (Hib) disease

Hib causes meningitis and pneumonia, as well as other conditions, in infants and young children.

In 2009 there were 11 cases of Hib disease notified.

Figure 4: Number of culture positive cases of *Haemophilus influenzae* type b invasive disease, 1990-2009



b. Measles disease

Measles can cause ear infections, pneumonia, and other complications. An acute brain infection (acute encephalitis) occurs in approximately 1 of every 1000 cases, and often results in permanent brain damage.

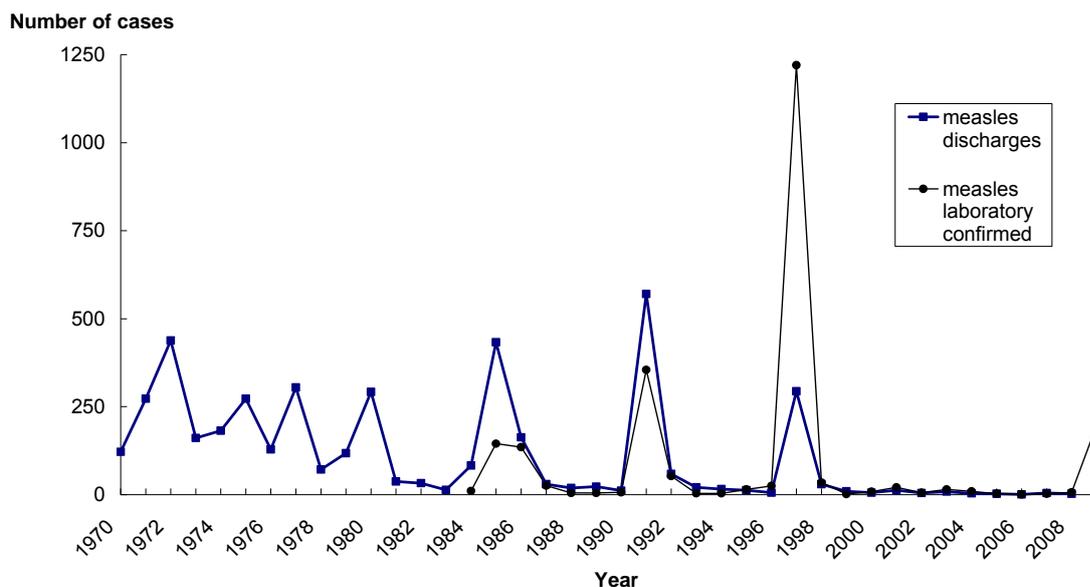
In 2009 there were measles outbreaks in several district health boards. While immunisation coverage rates did not prevent outbreaks, disease did not reach epidemic levels.

A proportion of measles cases were prevented in the 1997 epidemic, by an immunisation campaign. In 1997 there were 2,169 notified measles cases notified, of which 1,220 were laboratory confirmed. In 1997 there were 314 hospitalisations.

The 1991 measles epidemic involved 568 hospitalisations with the primary diagnosis of measles.

There have not been any confirmed measles cases in 2010 as at 17 March 2010.

Figure 5: Hospital discharges from measles 1970-2004, and laboratory confirmed cases 1984-2009

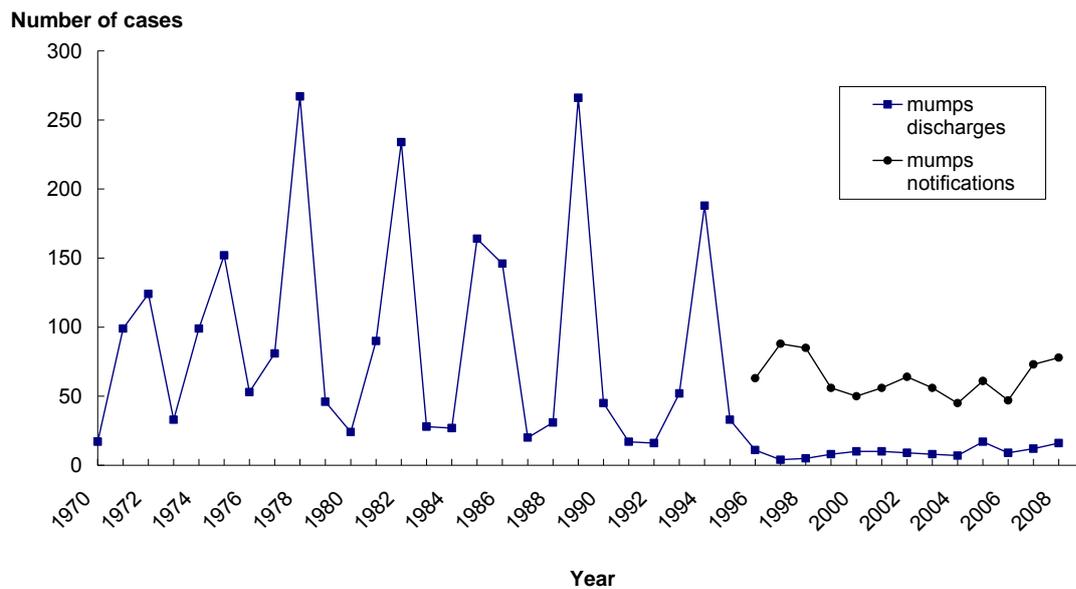


c. Mumps disease

Mumps is often characterised by fever, headache, and swelling and tenderness of one or more salivary glands.

Between 1970 and 1991 there were 2002 hospital admissions for mumps, with an increase in the number of cases every three to four years. There have not been any epidemics since 1994.

Figure 6: Hospital discharges from mumps 1970-2004, and notifications 1996-2009

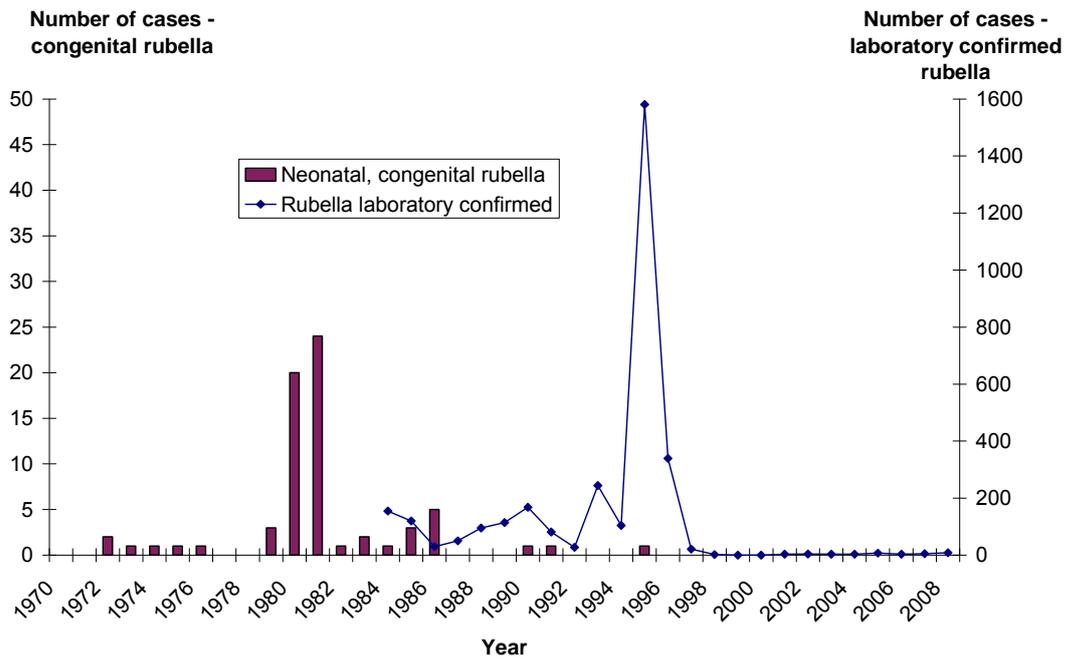


d. Rubella disease

While childhood rubella can have severe complications, immunisation is especially important to prevent maternal rubella. Maternal rubella in the first eight weeks of pregnancy results in fetal damage in up to 85 percent of infants.

In 2008 three cases of rubella were laboratory-confirmed. There were no cases of congenital rubella reported in 2008. The last recorded case of congenital rubella was reported in 1998.

Figure 7: Notifications of congenital rubella, 1970-2008, and laboratory confirmed cases, 1984-2008



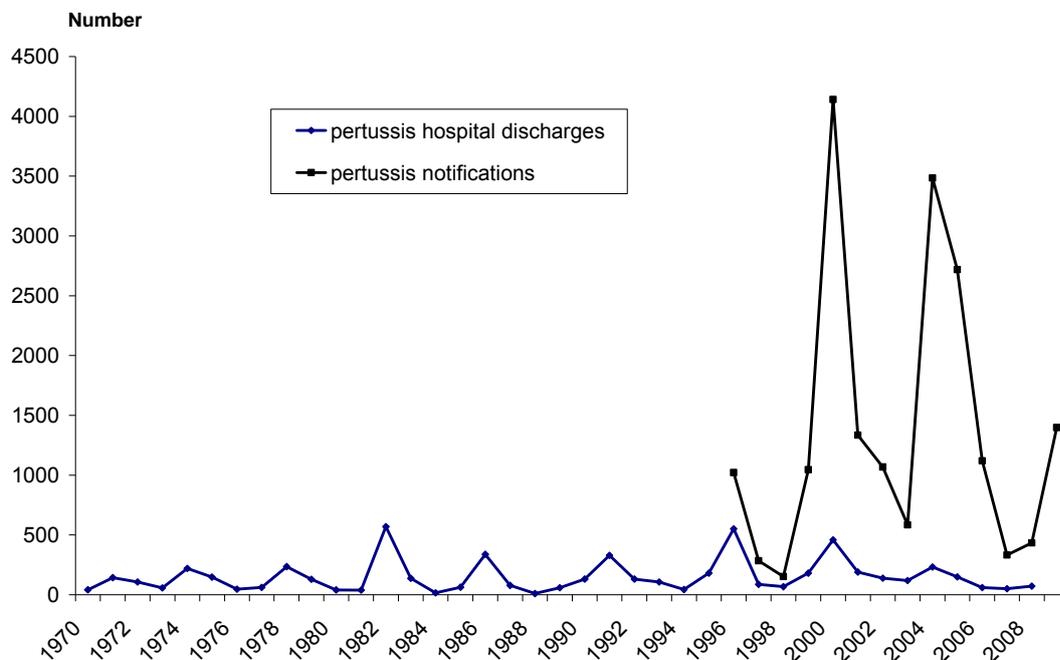
e. Whooping cough (pertussis) disease

Whooping cough can be a severe disease in the very young. For example, a study of children admitted to the national paediatric intensive care unit in Auckland from 1991 to 2003 found that of the 72 pertussis admissions, there were three deaths and six children were left with subsequent respiratory or neurodevelopmental problems. (Surradye J et al, Pertussis requiring intensive care, Archives of Diseases of Childhood, 2007; 92: 970-975).

In 2009, there were 1,397 cases of whooping cough notified. In 2010 pertussis notifications continue at elevated levels similar to those of 2009.

In 2000 and again in 2004 New Zealand experienced epidemics of whooping cough, with annual cases reported peaking at 4140 and 3485 respectively.

Figure 8: Hospital discharges from pertussis (whooping cough) 1970-2004, and notifications 1996-2009



f. Comparison of disease in New Zealand compared to other countries

Table 6. Most recent* notification rates per 100,000 population for frequently notified vaccine preventable diseases, by country of residence

Disease	Australia	New Zealand	USA	Canada	England/Wales
Hib disease	0.1	0.2	0.7	0.2	0.3
Measles	0.1	0.5	0	<0.05	4.6 (0.2) [†]
Mumps	1.2	1.7	0.1	0.1	31.1 (17.7) [‡]
Pertussis	55.1	72.8	8.9	8.8	1.0
Rubella	0.2	0.3	0	<0.05	2.5 (<0.05) [§]

* Australia 2005; New Zealand 2005; USA 2004; Canada 2004; England/Wales 2004.

† Incidence corrected for proportion serologically confirmed = 5%.

‡ Incidence corrected for proportion serologically confirmed = 57%.

§ Incidence corrected for proportion serologically confirmed = 0.2%

Source: Vaccine Preventable Diseases and Vaccination Coverage in Australia, 2003 to 2005
Vaccine preventable disease notification rates compared with other industrialised countries
<http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi31suppl.htm~cda-cdi31suppl-5.htm~cda-cdi31suppl-5e.htm>

International comparison of measles incidence

Measles or mumps disease incidence provides a measure of a country's immunisation coverage. They are both communicable diseases usually transmitted via exposure to infected respiratory secretions.

Sustained measles transmission has been eliminated in Australia, Canada and the US.

Measles continues to be reported from all regions of England (Health Protection Report 27 November 2009). The numbers of measles cases in England and Wales had increased sharply in 2008. The majority of cases were in children who were not fully protected with MMR vaccine. In order to control increasing numbers of disease and to prevent an epidemic, there has been a concerted MMR catch-up programme, launched in August 2008. Children who were not fully protected with MMR have been offered the vaccine.

There had been concerns about the MMR vaccine and autism following a United Kingdom study published in 1998.

International comparison of pertussis incidence

Increasing pertussis containing vaccine coverage reduces disease levels, but the three to five yearly epidemics continue in many countries. For example, some Australian states have experienced high whooping cough levels during 2008 and 2009.