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Whether these differences between our study population and the general Dutch population will be of influence for determining antibody levels in the general Dutch population should be further investigated. For some characteristics (age, gender, ethnicity, and urbanisation degree) the frequencies of seropositives can be weighted to the Dutch population.

The large serum bank that has been set-up will be used by many researchers who have been involved in the P2 project. Antibody levels as marker for protection against various infectious diseases will be determined: primarily against the infectious diseases included in the NIP (diphtheria, tetanus, pertussis, poliomyelitis, Haemophilus influenzae (type B), meningococcal group C disease, measles, mumps, rubella, hepatitis B, pneumococcal disease and cervical cancer); secondarily against diseases that might be vaccine preventable in the near future (gastroenteritis caused by rotavirus, varicella, herpes zoster) and against those diseases with a frequent sub clinical course; thirdly against other infectious diseases such as respiratory diseases (influenza), gastrointestinal diseases (salmonellosis, campylobacteriosis, gastroenteritis caused by norovirus, hepatitis A), zoonotic diseases (q fever, toxoplasmosis, toxocarosis, echinococcosis, hantavirus disease, hepatitis E), vector borne diseases (Lyme borreliosis, West Nile fever, dengue fever) or infections related to sexually transmitted diseases (herpes simplex, hepatitis C). Furthermore the collected diaries, DNA samples and supplementary questions in the questionnaire, for instance about allergies, will be used in additional studies.
The assessment of antibody levels in serum for the evaluation of the NIP, by means of large population-based studies like PIENTER, becomes more important in view of low disease incidence and smaller numbers of cases, which is due to the success of the NIP. By repeating such studies within ten year intervals we gain a lot of insight into the changes of the immunity of the population over time and in changes in infection pressure to further improve the NIP.

4 Conclusions/discussion

In the P2-study, a large serum bank has been established with 6,386 samples in the nationwide sample including the over sampling of migrants and 1,518 in the low immunization coverage sample. Furthermore, from 99.5% of the persons with serum a detailed questionnaire is available and from 80% of the persons with serum, who are eligible for participating in the NIP, also vaccination data are confirmed by the local authority for registration of vaccinations.
The response in the P2-study was lower than in the P1-study, performed in 1995/6 (33% vs. 50%). Invitees who did not want to participate have been asked to fill in the non-response questionnaire. Most frequently reported reason for non-participation was that they were too busy or that they did not feel like to participate in this study.
By comparing non-responders with participants, the non-responders were more likely to be male aged between 5-9 and 55-59 years old, to live in a very high urbanization degree, to be widower, to be less healthy and not participating in the NIP. The non-responders resembled the participants for the distribution of ethnicity, region, educational level and religion. Men between the age-categories 5-9 and 65-69 years old, non-Western migrants, persons living in the regions South-West and South-East and persons living in a very high urbanization degree were more likely to be absolute non-responder than participant. For the absolute non-responders only information from the population registers was available.
One of the possible reasons for the difference in response between P1 and P2 is that in the last ten years municipalities have expanded, which made that the invitees had to travel for longer distances to the blood sampling clinic. In 2007 the number of municipalities was 443, which was 625 in 1996 (CBS). From P1 it was clear that a telephone reminder increased the response rate.[23] Due to the increase of mobile phones and not registered telephone numbers in the last ten years, less invitees could be reminded by a telephone call, which also could have led to a lower response. Another explanation could be the relatively high percentage (~15%) of addresses that were incorrect in larger cities like Amsterdam. It was however not clear whether this percentage had increased during the last ten years. Some points for improvement for a next PIENTER 3 study are given in Appendix 12 together with a short evaluation regarding the logistics and design of the study.
The number of participants per each age stratum in the NS was about 300, which was the minimum number of participants aimed for. In most age strata the number of participants was even higher, for instance 413, 558 and 635 participants in the age strata 0, 1-4 and 5-9 years old, respectively. Only the age stratum 75-79 years contained less participants (n = 263).
In the low immunization coverage sample the number of participants per age strata varied between 69 (35-39 years and 50-54 years) and 210 (1-4 years). These numbers are sufficient (at least 68 participants) to determine the seroprevalence in the three age groups of orthodox reformed individuals, which were the groups most difficult to include in the study.
The number of participants per migrant group was also above 68 except for the group of first and second generation participants from Morocco or Turkey aged 50-79 years (n = 60). This makes it also possible to calculate the seroprevalence for each migrant group. Furthermore, the seroprevalence for migrants living in municipalities belonging to the highest urbanization degree (1) and migrants living in municipalities belonging to the lower urbanization degrees (2-5) will be compared.

In general, the participants in the nationwide sample resemble very well the overall Dutch population. For example, the distribution by education level, religion, net monthly income, marital status, condom use with steady partner in the nationwide sample was comparable with the distribution in the Dutch population. Furthermore the mean age at first sexual intercourse was similar. Inevitable some differences do exist, for instance participants were more likely to live in the regions North-East and North-West, to have a higher mean household size and not using drugs.

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Table 3.51 I have doubts about the safety of the vaccinations children receive for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Very true	29	1.6	1.0-2.2	24	4.9	0.6-9.2
True	147	8.0	6.6-9.4	86	18.5	14.4-22.7
Neutral	395	22.2	20.6-23.9	151	27.6	21.8-33.5
Not true	924	52.2	48.6-55.9	217	43.7	36.1-51.4
Very not true	287	15.9	13.0-18.8	22	5.2	1.3-9.0
Missing	112			6		

Most parents reported that the immune system of their child would not be negatively affected by vaccination (Table 3.52). However, also a relative high percentage of parents reported neutral in the NS and neutral or true in the LVCS.

Table 3.52The immune system of my child will negatively be affected by vaccination for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Very true	59	3.3	1.3-5.4	23	5.2	1.2-9.1
True	130	7.4	6.0-8.7	65	14.2	9.2-19.2
Neutral	373	20.8	18.8-22.9	118	24.9	20.6-29.2
Not true	979	56.0	51.5-60.4	253	48.7	41.3-56.2
Very not true	224	12.5	10.4-14.6	36	7.0	2.9-11.2
Missing	129			11		

Most parents reported that the childhood vaccinations are good for the health protection of others (Table 3.53). However, also a relative high percentage of the parents reported neutral in the NS and neutral or not true in the LVCS.

Table 3.53 Childhood vaccinations are good for the health protection of others for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Very true	347	19.3	15.7-22.8	48	10.3	6.1-14.4
True	961	54.1	50.5-57.7	228	45.0	31.2-58.7
Neutral	363	20.5	17.8-23.2	142	27.3	18.2-36.4
Not true	88	4.8	3.7-6.0	63	13.5	9.0-17.9
Very not true	20	1.2	0.6-1.9	19	4.0	1.6-6.4
Missing	115			6		

CAIF S.A.
María Bernarda Belay
Farmacéutica
Co - Directora Técnica
M.P. 15.148

Table 3.48 Maximum number of injections still acceptable for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
None	24	1.6	0.7-2.5	94	22.3	8.8-35.8
1 per time	245	15.5	11.6-19.4	53	10.1	7.1-13.1
2 per time	1,235	79.7	75.1-84.2	307	66.5	53.5-79.4
3 per time	32	2.0	1.1-3.0	1	0.3	0.00-0.9
4 per time	16	1.1	0.3-1.9	4	0.8	0.00-2.2
Each number is acceptable	2	0.1	0.00-0.3	0		
missing	340			47		

Most parents reported it was true that childhood vaccinations are good for the protection of the health of their child (Table 3.49). In the LVCS the percentage of parents who reported neutral, not true and very not true was higher compared to the NS.

Table 3.49 Childhood vaccinations are good for the protection of the health of my child for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Very true	817	45.0	41.3-48.7	119	23.5	18.7-28.3
True	877	48.6	44.7-52.5	245	48.8	42.6-55.0
neutral	86	5.1	3.8-6.4	68	12.6	8.2-16.9
Not true	17	1.0	0.4-1.6	40	9.0	3.9-14.2
Very not true	4	0.3	0.03-0.6	30	6.1	1.8-10.5
missing	93			4		

Most parents reported it was not true that there is no need for vaccinating healthy children (Table 3.50). The percentage of parents who reported very true, true and neutral was higher in the LVCS than in the NS.

Table 3.50 There is no need for vaccinating healthy children for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Very true	26	1.3	0.7-1.8	42	8.7	0.6-16.7
True	71	3.7	2.0-5.4	41	9.3	5.8-12.8
neutral	139	8.4	6.9-9.9	73	15.5	11.8-19.3
Not true	934	52.5	48.7-56.2	256	49.4	40.0-58.8
Very not true	615	34.2	31.6-36.8	89	17.1	12.9-21.3
missing	109			5		

Most parents reported that they had no doubts about the safety of the vaccinations their children received (Table 3.51). However, also a relative high percentage of parents reported neutral in the NS and neutral or true in the LVCS.

3.18 Opinion on vaccinations

Participants sometimes reported more than one opinion on childhood vaccinations, although this was not reported as an option in the questionnaire. The data were however analyzed as if there was an option to report more than one answer. The percentage of participants in NS who reported their opinion was influenced by anthroposophic, homeopathic or alternative medicine ideas was respectively, 11%, 18% and 12%. Remarkably, no participant in the LVCS reported they were influenced by anthroposophic ideas (Table 3.46).

Table 3.46 Opinion on childhood vaccinations

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Applicable	493	8.2	7.0-9.3	415	26.0	18.9-33.0
Not applicable	5,509	91.8	90.7-93.0	1,038	74.0	67.0-81.1
Missing	346			64		
Anthroposophic	52	10.6	7.2-14.0	0		
Homeopathic	90	18.2	14.4-22.0	16	3.7	0.00-7.7
Alternative medicine	65	12.4	9.0-15.9	17	5.3	2.6-7.9
Religion	91	18.7	10.7-26.8	349	84.5	75.2-93.8
Other	196	40.2	34.4-46.0	33	6.5	1.1-12.0

Most parents were very sure that their child would receive the future vaccinations, respectively 64% and 43% in NS and LVCS (Table 3.47). In the LVCS the percentage of parents who would surely not administer the future vaccinations to their child was 13% whereas this was 0.4% in the NS.

Table 3.47 Future vaccinations for child to receive will be administered for participants aged 0-14 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Very sure	1,184	63.7	60.6-66.8	227	42.8	38.4-47.2
Sure	387	21.1	18.8-23.4	112	20.4	12.7-28.1
Probably yes	63	3.6	2.8-4.4	25	5.6	1.2-10.0
Probably yes/no	32	2.0	1.1-3.0	13	2.9	1.5-4.3
Probably no	14	0.8	0.4-1.3	13	2.9	1.8-4.0
Surely not	7	0.4	0.00-0.9	61	12.5	3.0-22.0
Not applicable	123	8.3	6.9-9.8	50	12.8	5.6-20.1
Missing	84			5		

Most parents reported that two injections per consultation visit would be the maximum that still was acceptable (Table 3.48). Note the relative high percentage of parents reporting zero injections in the LVCS.

Most times yes	29	1.8	1.2-2.4	3	0.6	0.00-1.2
Sometimes yes/no	15	0.8	0.3-1.3	0		
Most times no	13	0.8	0.3-1.3	3	1.0	0.00-2.2
never	117	6.2	5.0-7.3	22	4.4	2.6-6.2
Won't answer	47	2.5	1.7-3.2	20	5.1	2.9-7.3
Not applicable	1,449	83.8	82.1-85.6	317	86.7	83.0-90.5
Missing	2,717			637		

*the participants who could have filled in this question should have met one of the following conditions: marital status is married or living together or steady partner is yes or won't answer or sexual intercourse is yes, don't know or won't answer or number of sexual partners last 6 months is yes or won't answer or sex of sexual partner has been filled in

**the participants who could have filled in this question should have met one of the following conditions: marital status is married or living together or steady partner is yes or won't answer

***the participants who could have filled in this question should have met one of the following conditions: number of sexual partners last 6 months is yes or won't answer or country of casual partner is known

In NS the percentage of participants reporting one or more STDs was 5.2%, which was higher than in the LVCS (2.4%). The percentage of participants (aged 12-25 years) reporting one or more STDs (without HIV) in the study by De Graaf et al. [20] was 0.6% for boys and 1.2% for girls, which was 0.4% and 4.1% in NS and 0.0% and 1.6% in LVCS. The percentage of participants (aged 12-25 years) who reported having HIV was 0.0% in the study by De Graaf [20] and also 0.0% in NS and LVCS. In NS the most reported sexual transmitted disease was Chlamydia and in the LVCS this was genital warts (Table 3.45). Respectively 8 (0.2%) and 3 (0.3%) persons reported they used drugs in NS and LVCS, respectively. In the report by Rodenburg et al. [22] the percentages of individuals aged 15-64 years who reported in 2005 to have ever used drugs are much higher (0.6% for heroin, 1.4% for LSD, 2.1% for amphetamine, 3.4% for cocaine, 4.3% for ecstasy, 6.1% for hard drug and 22.6% for cannabis).

Table 3.45 Reported sexually transmitted diseases (STD)* and drug use for participants aged 15-79 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Chlamydia	83	2.1	1.5-2.7	4	0.6	0.08-1.1
Hepatitis B	21	0.5	0.2-0.7	1	0.1	0.00-0.4
Gonorrhoea	40	1.1	0.6-1.5	1	0.04	0.00-0.1
Syphilis	10	0.2	0.05-0.4	0		
Herpes genitals	36	0.9	0.6-1.2	8	0.8	0.09-1.6
Genital warts	52	1.3	1.0-1.7	7	0.9	0.3-1.5
HIV	3	0.09	0.00-0.2	0		
Drug use						
Yes	8	0.2	0.01-0.4	3	0.3	0.00-0.7
No	4,340	99.7	99.4-99.9	985	99.7	99.3-100
Won't answer	7	0.1	0.02-0.2	0		
Missing	99			23		

*possible answers per STD were yes, no, won't answer, number of missing in respectively NS and LVCS were for Chlamydia 328/87, hepatitis B 393/100, Gonorrhoea 403/102, Syphilis 396/100, herpes genitals 375/95, genital warts 369/97, HIV 390/97

Missing	2			0		
Sexual partners last 6 months						
Yes	3,453	94.1	93.2-95.0	711	91.5	89.3-93.8
Won't answer	244	5.9	5.0-6.8	71	8.5	6.2-10.7
Missing	757			229		
No. sexual partners last 6 mnths	2,788	1.1 (mean no.)	1.0-1.1	600	1.0 (mean no.)	1.0-1.1
Missing	665			111		
Sexes of these sexual partners						
Male	1,521	48.6	46.5-50.7	305	46.0	42.0-50.1
Male and female	8	0.3	0.08-0.4	4	0.5	0.00-1.1
Female	1,220	51.0	48.9-53.2	280	53.5	49.0-58.0
Won't answer	3	0.1	0.00-0.2	0		
Missing	701			122		
Condom use last time*						
Yes	349	12.3	11.1-13.5	58	8.8	6.7-10.9
No	2,435	83.5	82.3-84.8	551	82.0	78.0-86.0
Won't answer	146	4.2	3.3-5.0	68	9.1	6.2-12.0
Missing	1194			242		
Condom use last month with steady partner**						
always	163	6.4	5.7-7.1	34	5.6	3.3-7.9
Most times yes	74	3.0	2.3-3.7	9	1.2	0.2-2.2
Sometimes yes/no	86	3.3	2.7-4.0	23	4.0	2.4-5.6
Most times no	127	4.8	4.0-5.6	25	3.9	1.9-6.0
never	1,888	72.7	70.7-74.7	436	70.6	65.1-76.1
Won't answer	53	1.9	1.3-2.5	36	5.7	3.9-7.5
Not applicable	235	7.8	6.8-8.9	61	8.9	6.1-11.7
Missing	836			183		
Condom use last month with casual partner***						
always	67	4.1	3.2-5.0	9	2.2	0.6-3.7

3.17 Sexual history

No large differences were found in the sexual history of the participants between NS and LVCS. The distribution of variables on sexual behaviour among the participants in NS and LVCS was compared to the sexual behaviour reported in sexual behaviour studies in the Netherlands.[20-21]. The percentage of participants aged 12-25 years in the study by De Graaf et al.[20] with a steady partner (at this moment) was 58% for girls and 45% for boys. When comparing these values with those in NS and LVCS, it was found that the percentage with a steady partner was similar for girls (in both samples 56%) but lower for boys (respectively, 39% and 32% in NS and LVCS). Looking at the total adult population (15-79 years old) about 80% had a steady partner (Table 3.44)
For participants aged 12-25 years in the study by De Graaf et al. [20] the mean age at first sexual intercourse was 16.7 years, which was 16.9 and 17.3 in respectively NS and LVCS. In both samples for 15-79 year-olds, the mean age at first sexual intercourse was about 19 years and the number of sexual partners during the last six months was on average one. Of the participants, aged 19-69 years, in the study by Bakker [21] most participants (73%) also reported to have one sexual partner during the last six months.
Most participants (15-79 years old) reported they never used a condom with their steady partner and also not with a casual partner (note, very low numbers). The condom use with steady partner for participants aged 19-69 years in the study by Bakker et al. [21] was similar when compared to both samples.
In the NS the percentage of males who reported to have sex with only males (concerning only sexual partners during the last 6 months) was 1.0% (12 of the 1218), which was similar for women who reported to have sex with only women (1.1%, 18 out of 1534). In the LVCS only one (0.4%) man reported to have sex with only males and only one (0.4%) woman reported to have sex with only females. Bakker et al. [21] found that 4.0% of the men identified themselves as homosexual, 3.1% bisexual and 92.9% heterosexual, which was respectively 2.6%, 3.3% and 94.1% for women. Note that in P2 only participants with a sexual partner during the last six months have been asked to report the gender of their sexual partners, whether in the study by Bakker et al. [21] all participants were asked how they identified themselves not taking into account any sexual partner.

Table 3.44 Sexual history for participants aged 15-79 years

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Steady partner						
Yes	3,356	78.6	77.2-80.0	784	81.2	77.2-85.2
No	950	20.9	19.5-22.3	200	18.1	14.0-22.2
Won't answer	26	0.5	0.3-0.7	7	0.7	0.06-1.4
Missing	122			20		
Sexual intercourse						
Yes	3,247	76.8	75.2-78.4	629	65.4	60.7-70.0
Not applicable	368	8.2	7.4-9.0	110	10.8	8.2-13.3
Don't know	292	6.7	5.7-7.7	88	9.0	5.7-12.3
Won't answer	378	8.3	7.4-9.3	143	14.9	11.4-18.5
Missing	169			41		
Mean age at first sexual intercourse	3,245	19.3 (mean age)	19.2-19.5	629	19.5 (mean age)	19.0-20.0

profession or as a volunteer, which was applicable for about 55% in both samples. For those with contact with groups of individuals, most reported to have contact with clients, 68% and 67% in NS and LVC, respectively (Table 3.42).

Table 3.42 Contact with groups of individuals within profession or as a volunteer for participants aged 15-79 years

	NS			LVC		
	N	%	95% CI	N	%	95% CI
Applicable	2,259	56.3	54.1-58.6	507	55.2	51.1-59.3
Not applicable	2,033	43.7	41.4-45.9	462	44.8	40.7-48.9
Missing	162			42		
Patients	452	18.7	16.6-20.8	91	15.6	13.0-18.3
Clients	1,472	67.5	65.4-69.7	323	67.1	59.9-74.3
Children/students	834	35.8	33.6-37.9	185	36.0	28.5-43.4
Animals	273	11.9	10.2-13.7	105	20.9	13.0-28.9

Most contacts were made with individuals in the age-class 10-19 years old; the mean number of contacts was respectively 7.2 and 6.2 in NS and LVCS (Table 3.43). Most participants reported the number of conversations on Tuesday.

Table 3.43 Mean number of conversations with persons in a certain age group and the day of the week the conversations took place

	NS			LVC		
	N	Mean no.	95% CI	N	Mean no.	95% CI
0-9 yrs	2352	5.9	5.2-6.5	683	5.4	4.7-6.0
0-4 yrs	1351	3.1	2.8-3.3	439	2.6	2.0-3.2
5-9 yrs	1600	5.4	4.6-6.1	477	4.7	4.2-5.1
missing	198			56		
10-19 yrs	2009	7.2	6.7-7.6	584	6.2	4.8-7.6
20-29 yrs	2498	4.1	3.9-4.4	656	4.0	3.1-4.8
30-39 yrs	3187	4.1	3.9-4.4	755	3.9	3.3-4.5
40-49 yrs	3025	3.9	3.7-4.2	688	3.5	3.0-4.1
50-59 yrs	2461	3.3	3.1-3.4	592	2.9	2.6-3.2
60-69 yrs	1671	3.0	2.8-3.2	403	2.8	2.4-3.2
70-79 yrs	1015	2.7	2.5-3.0	273	2.5	2.0-3.0
80-89 yrs	467	2.7	2.2-3.2	127	2.1	1.4-2.8
90+	116	2.2	1.6-2.8	35	1.7	0.6-2.9
missing	33			10		
Total	5488	15.2	14.6-15.9	1324	15.2	13.2-17.1
Missing	860			193		
		%			%	
Monday	1028	18.9	16.5-21.4	212	16.6	11.6-21.6
Tuesday	1379	24.8	22.5-27.1	345	25.7	18.1-33.2
Wednesday	710	12.9	11.1-14.8	202	14.8	10.8-18.8
Thursday	514	9.3	7.7-11.0	159	12.1	7.2-16.9
Friday	412	7.6	6.4-8.8	106	8.0	5.6-10.4
Saturday	664	12.6	10.9-14.3	122	9.9	6.9-12.8
Sunday	750	13.8	12.6-15.1	172	13.0	10.2-15.8
Missing	31			6		

The percentage of participants who have eaten raw or half-baked products during the last 12 months was 60% in NS and 54% in LVCS (Table 3.40). Most of the participants ate beef products and ate the raw or half-baked meat products with a frequency of less than a month. Despite fish is not a meat product, most participants reported fish by other raw or half-baked meat product, respectively 49 and 6 times. Note participants could have eaten more than one specific raw or half-baked meat product.

Table 3.40 Eating raw or half-baked meat products during last 12 months

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	3,344	59.8	55.4-64.2	697	53.9	49.1-58.7
No	1,381	21.5	19.6-23.4	395	29.7	25.9-33.4
Don't know	1,398	18.7	15.3-22.0	390	16.4	13.7-19.1
Missing	225			35		
Beef	3,244	97.3	96.6-97.9	682	97.6	95.6-99.6
Pork	1103	34.6	32.4-36.9	174	26.5	20.0-33.0
Fowl	252	7.7	6.6-8.9	33	5.0	2.8-7.2
Other	80	2.4	1.8-3.1	7	1.0	0.4-1.6
Eating frequency						
Daily	40	1.1	0.7-1.5	5	0.4	0.00-1.0
Weekly	744	23.5	21.8-25.1	137	21.6	16.5-26.8
Monthly	967	30.3	28.6-31.9	215	33.1	27.5-38.8
Less than monthly	1,357	40.5	38.3-42.6	302	41.6	35.3-48.0
Don't know	148	4.7	4.0-5.5	21	3.2	1.0-5.5
Missing	88			17		

The percentage of participants who ate unwashed raw vegetables was 30% in NS and 24% in LVCS (Table 3.41). Most of those participants ate weekly unwashed raw vegetables.

Table 3.41 Regular eating unwashed raw vegetables

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	1,715	29.6	27.5-31.7	340	24.1	19.4-28.8
No	4,492	69.2	67.1-71.3	1,148	74.8	70.6-79.0
Don't know	72	1.2	0.9-1.5	14	1.1	0.2-1.9
Missing	69			15		
Eating frequency						
Daily	189	11.0	8.7-13.3	27	6.5	2.1-11.0
Weekly	831	49.1	46.6-51.5	165	51.6	40.3-62.9
Monthly	357	21.4	19.0-23.8	81	23.9	13.4-34.4
Less than monthly	338	18.6	16.6-20.6	67	18.0	11.4-24.6
Missing	0			0		

3.16 Social contacts

The number and type of social contacts is an important factor for determining the spread of airborne infectious diseases. Participants could have contact with various groups of individuals within their

The percentage of participants keeping farm animals was higher in LVCS than in NS, respectively 17% and 6% (Table 3.37). Note participants may keep more than one specific farm animal. In both samples most participants kept poultry, respectively 56% and 57%. Most reported answer by other farm animals was horses, respectively 101 and 48 times.

Table 3.37 Keeping farm animals

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	386	6.4	4.7-8.2	243	17.1	8.5-25.7
No	5,850	93.6	91.8-95.3	1,254	82.9	74.3-91.5
Missing	112			20		
Pig	17	4.4	2.1-6.8	28	11.5	1.3-21.7
Cow	84	22.2	16.1-28.4	58	23.4	8.6-38.1
Sheep	89	22.9	17.7-28.2	71	31.9	25.3-38.4
Goat	73	19.3	15.1-23.5	49	20.5	16.4-24.7
Poultry	210	55.8	49.9-61.6	143	57.4	44.5-70.4
Other	114	30.9	25.6-36.2	57	23.3	14.7-31.9
Missing	13			2		

3.14 Bitten by ticks

About 80% of the participants were never bitten by ticks (see Table 3.38). Of the participants who were bitten by ticks most participants were bitten 1-4 times, respectively 11% and 9% in NS and LVCS.

Table 3.38 Bitten by ticks

	NS			LVC		
	N	%	95% CI	N	%	95% CI
Never	4,969	78.3	76.7-79.9	1252	81.8	75.8-87.8
1-4 times	650	11.2	9.6-12.7	117	8.7	4.3-13.0
5-9 times	46	0.7	0.5-1.0	8	0.7	0.00-1.7
10 or more times	34	0.7	0.4-0.9	8	0.5	0.00-1.3
Don't know	547	9.1	7.9-10.3	108	8.3	6.8-9.8
Missing	102			24		

3.15 Vegetarian, eating raw meat and unwashed vegetables

Only a small percentage of the participants reported to be vegetarian, respectively 1.8% and 0.8% in NS and LVCS (Table 3.39).

Table 3.39 Being vegetarian

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	122	1.8	1.3-2.2	13	0.8	0.2-1.4
No	6,145	98.2	97.8-98.7	1,492	99.2	98.6-99.8
Missing	81			12		

Table 3.35 Contact with cats per age group

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
0-14 years						
Yes	903	49.8	42.1-57.5	224	47.1	40.0-54.2
No	861	44.4	36.4-52.3	245	46.0	38.6-53.5
Don't know	105	5.8	4.5-7.1	32	6.9	5.0-8.7
Missing	25			5		
Yes,						
with cats < 1 yr	80	9.1	6.6-11.7	31	13.0	7.4-18.6
with cats > 1 yr	642	71.7	67.1-76.4	137	60.4	48.8-72.0
with cats <1 and >1 yr	163	19.1	15.7-22.6	52	26.6	13.5-39.7
missing	18			4		
15-79 years						
Yes	2,413	57.5	54.9-60.1	464	47.3	36.3-58.3
No	1,991	42.5	39.9-45.1	536	52.7	41.7-63.7
Missing	50			11		
Yes,						
with cats < 1 yr	127	5.6	4.6-6.6	41	8.9	5.6-12.3
with cats > 1 yr	1,773	74.8	72.5-77.0	316	70.7	62.8-78.7
with cats <1 and >1 yr	459	19.7	17.7-21.6	93	20.3	14.3-26.4
missing	54			14		

In both samples about 60% of the participants kept one or more pets at home, which were mostly dogs followed by cats (Table 3.36). Note participants may keep more than one pet. Most reported answer by other pets was reptile, 71 and 13 times in NS and LVCS, respectively.

Table 3.36 Keeping pets

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	3,564	59.1	55.4-62.8	907	62.4	58.6-66.3
No	2,737	40.9	37.2-44.6	603	37.6	33.7-41.4
Missing	47			7		
Dog	1,461	42.1	39.2-45.0	442	49.6	41.7-57.5
Cat	1,491	42.0	39.1-44.8	354	38.9	30.5-47.3
Bird	625	17.3	15.6-19.0	216	23.5	21.0-25.9
Rabbit/ guinea pig/ hamster	1,190	33.2	31.7-34.6	326	35.8	31.6-40.0
Mouse/rat	134	4.1	3.4-4.8	22	2.3	0.7-3.8
Fish	955	26.5	24.8-28.1	247	26.2	22.3-30.1
Other	157	4.5	3.6-5.3	38	4.0	1.4-6.5
Missing	10			1		

Table 3.34 Working or playing in garden per age group

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes						
0-14	938	51.1	45.7-56.5	291	60.6	56.4-64.7
15-79	2,935	69.3	66.0-72.5	784	80.6	76.0-85.3
No						
0-14	828	43.3	38.5-48.2	189	34.7	32.0-37.5
15-79	1,464	30.7	27.5-34.0	220	19.4	14.7-24.0
Don't know						
0-14	95	5.6	4.3-6.8	21	4.7	1.9-7.5
Missing						
0-14	33			5		
15-79	55			7		
Time per week						
0-14	824	3.0 (mean no.)	2.7-3.4	270	3.0 (mean no.)	1.7-4.4
15-79	2,767	3.8 (mean no.)	3.4-4.2	738	4.6 (mean no.)	3.4-5.8
Missing						
0-14	114			21		
15-79	168			46		

3.13 Contact with cats and keeping pets and farm animals

The percentage of children with contact with cats was somewhat lower than for adults in NS and similar in LVCS (Table 3.35).

Table 3.32 Piercing or tattoo

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	476	8.0	7.0-9.0	66	5.3	3.3-7.4
No	5,786	92.0	91.0-93.0	1,435	94.7	92.6-96.7
Missing	86			16		

3.12 Outdoor activities possibly related to infectious diseases

The percentage of children (< 5 years old) playing in a sandbox was 53% and 63% in NS and LVCS, respectively (Table 3.33). Note participants could play in sandboxes at more than one location. Most children in NS played in the sandbox located at school and in LVCS in the sandbox at home. The children played on average 4.1 and 4.7 hours in a sandbox per week and most children never put sand in their mouth, respectively 57% and 62%.

Table 3.33 Playing in sandbox for participants less than five years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	450	53,4	48,7-58,1	174	62,8	51.7-74.0
No	392	46.6	41,9-51.3	103	37.2	26.0-48.3
Missing	12			0		
Place sandbox						
Own garden	255	62,3	53,8-70.8	131	75.6	68.9-82.3
School	348	76.5	70.7-82.4	93	53.5	47.6-59.5
Park/playing ground	234	52.6	46.4-58.8	75	42.5	14.5-70.5
Missing	1			0		
Duration time per week	418	4.1 (mean no.)	3.6-4.5	167	4.7 (mean no.)	3.6-5.9
Missing	32			7		
Putting sand in mouth						
Never	270	57.2	52.4-62.0	107	62.1	57.0-67.2
Sometimes	168	40.9	36.3-45.5	61	34.9	29.9-39.9
Often	9	1.9	0.6-3.3	5	3.0	0.2-5.7
Missing	3			1		

More adults than children were working/playing in the garden and also spent more time in the garden (Table 3.34). The percentage of participants working/playing in the garden was higher in the LVCS in both age groups compared to the NS.

Table 3.29 Having had chicken pox in the past

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	3,725	62.3	60.6-64.0	859	61.5	56.8-66.2
No	1,098	14.6	12.6-16.6	300	13.9	11.2-16.6
Don't know	1,364	23.1	21.9-24.3	322	24.6	19.2-30.0
missing	161			36		

3.11 Blood donor, having received blood products and having a piercing or tattoo

Donating or receiving blood products in foreign countries and skin penetrating procedures (like a tattoo) could be considered a risk for getting an infectious disease through blood contact. The percentage of participants aged 18-79 years who donate or have donated blood was respectively 24% and 30% in NS and LVCS (Table 3.30).

Table 3.30 Blood donor for participants aged 18*-79 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	941	23.5	21.4-25.6	265	29.7	20.4-39.0
No	3,288	76.5	74.4-78.6	678	70.3	61.0-79.6
Missing	32			15		

*Nobody below 18 years old had answered that they donated blood

The percentage of adults (15-79 years) who had received blood products was 11% and 9% in NS and LVCS, respectively (Table 3.31). Almost all participants had received these products in the Netherlands.

Table 3.31 Having received blood products for participants aged 15-79 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	528	11.2	10.2-12.2	107	9.3	6.5-12.1
No	3,442	80.0	78.6-81.3	805	83.4	79.9-86.8
Don't know	402	8.8	7.9-9.8	77	7.3	4.8-9.8
Missing	82			22		
Blood products received in						
The Netherlands	492	96.1	94.3-98.0	102	99.6	98.7-100
Other country	23	3.9	2.0-5.7	1	0.4	0.00-1.3
Missing	13			4		

The percentage of participants with a piercing or a tattoo was 8% and 5% in NS and LVCS, respectively (Table 3.32).

Table 3.27 Swollen painful cheeks and fever during last 12 months and mumps diagnosed

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes, painful cheeks with fever	59	0.9	0.6-1.1	12	0.6	0.2-0.9
Yes, painful cheeks without fever	42	0.7	0.4-1.0	10	0.9	0.2-1.6
No	5,995	97.5	96.8-98.2	1,440	97.7	96.6-98.7
Don't know	72	0.9	0.6-1.3	15	0.9	0.4-1.4
missing	180			40		
Visited GP						
Yes, diagnosed mumps	9	8.4	2.6-14.2	2	8.5	0.00-20.2
Yes, not diagnosed mumps	38	42.2	30.6-53.8	12	56.9	37.1-76.7
No	44	46.3	36.8-55.9	6	34.6	18.3-50.9
Don't know	3	3.1	0.00-6.9	0		
Missing	7			2		

The percentage of participants who reported red spots on their body with or without fever during the last twelve months was 4.3% and 3.1% in NS and LVCS, respectively. Most participants (62% and 70%, respectively) did not visit a GP for these symptoms (Table 3.28).

Table 3.28 Red spots on body and fever during last 12 months and measles diagnosed

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes, red spots body with fever	92	1.1	0.8-1.5	29	0.7	0.3-1.0
Yes, red spots body without fever	222	3.2	2.7-3.6	60	2.4	2.0-2.8
No	5,810	94.2	93.5-94.9	1,382	95.5	94.9-96.2
Don't know	95	1.5	1.1-1.9	22	1.3	0.8-1.9
missing	129			24		
Visited GP						
Yes	117	36.1	30.2-42.0	26	30.3	23.5-37.0
No	190	62.1	56.0-68.3	63	69.7	63.0-76.5
Don't know	4	1.8	0.00-4.0	0		
Missing	3			0		

More than 60% of all participants reported they have had chickenpox in the past (Table 3.29). A relative large percentage of all participants (23% and 25%, respectively) could not remember they have had chickenpox in the past.

Table 3.26 Coughing and fever during last 12 months and pertussis diagnosed

	NS			LVC		
	N	%	95% CI	N	%	95% CI
Coughing						
Yes	1,464	22.2	21.1-23.3	315	18.8	14.9-22.8
< 3 mnths ago and still coughing	366	28.0	24.7-31.4	75	28.4	19.9-36.9
< 3 mnths ago, not coughing anymore	473	37.4	34.4-40.3	109	38.1	28.0-48.2
3-6 mnths ago	210	16.6	13.7-19.6	57	19.7	7.9-31.5
6-12 mnths ago	207	18.0	14.3-21.6	33	13.8	5.3-22.3
missing	208			41		
No	4,696	75.9	74.8-77.0	1,172	79.9	76.2-83.7
Don't know	116	1.9	1.5-2.2	19	1.2	0.7-1.8
Missing	72			11		
Visited GP						
Yes, diagnosed pertussis	30	2.1	1.3-2.9	6	1.4	0.00-3.2
Yes, not diagnosed pertussis	523	34.4	31.5-37.3	122	35.9	28.4-43.4
No	866	62.8	59.8-65.8	176	61.6	54.8-68.3
Don't know	14	0.8	0.2-1.3	4	1.1	0.3-2.0
Missing	31			7		

The percentage of participants who reported swollen painful cheeks with or without fever during the last twelve months was 1.6% and 1.4% in NS and LVCS, respectively. Most participants (46% and 35%, respectively) did not visit the GP for these complaints (Table 3.27). Of those who visited the GP, 19% was diagnosed as mumps by the GP in the NS, which was 14% in the LVCS.

3.10 Infectious diseases participants have had in the past

The percentage of participants who reported having had tuberculosis in the past was about 1% in both samples (Table 3.25).

Table 3.25 Having had tuberculosis in the past

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Ever tbc						
Yes	75	1.2	0.8-1.5	14	0.9	0.2-1.5
No	6,042	96.5	95.4-97.6	1.463	97.5	96.4-98.5
Don't know	168	2.3	1.4-3.3	21	1.7	1.2-2.2
Missing	63			19		
Positive mantouxtest						
Yes	323	5.3	4.8-5.8	75	5.4	4.1-6.7
No	5,438	87.2	86.2-88.3	1,339	88.6	86.7-90.5
Don't know	481	7.4	6.5-8.4	82	6.0	5.0-7.1
Missing	106			21		
Participated in GGD contact research						
Yes	651	10.7	9.7-11.8	172	13.5	10.5-16.5
No	5,105	81.5	79.6-83.5	1,235	79.5	75.3-83.8
Don't know	484	7.7	6.5-9.0	86	6.9	5.0-8.9
Missing	108			24		
Vaccinated against tbc*						
Yes	533	8.7	7.2-10.1	64	5.4	3.0-7.8
No	4,280	68.8	66.4-71.2	1,231	79.1	73.0-85.3
Don't know	1,328	22.5	20.8-24.3	181	15.5	11.4-19.6
Missing	207			41		

*In the Netherlands children 0-12 years of age who have at least one parent born in a high endemic country for tuberculosis receive vaccination against tuberculosis (not in NIP)

The percentage of participants who reported coughing for more than two weeks during the last twelve months was 22% and 19% in respectively the NS and LVCS (Table 3.26). Most participants reported that the coughing for more than two weeks took place longer than 3 months ago and that they had recovered. Most participants, who reported coughing for more than two weeks, did not visit the GP (63% and 62% in NS and LVCS, respectively). Of those who visited the GP, only a small percentage of the reported coughing for more than two weeks was diagnosed as pertussis by the GP (5% in both samples).

Table 3.23 Travelling data

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Ever been in one or more of following countries	2,430	39.2	35.1-43.3	275	21.2	17.2-25.2
Asia	1,489	24.9	22.7-27.0	160	11.8	8.2-15.5
Africa	1,035	17.5	15.5-19.5	135	10.8	7.5-14.1
South/ Middle America	882	13.8	12.1-15.6	98	7.8	4.8-10.8
None of above	3,853	60.8	56.7-64.9	1,221	78.8	74.8-82.8
Missing	65			21		
Duration last visit						
< 6 weeks	1,686	73.3	67.9-78.8	218	83.4	78.0-88.9
6 weeks and 3 mnths	178	6.5	4.4-8.6	13	4.1	1.1-7.1
3 and 12 mnths	165	6.4	4.9-7.9	14	5.4	2.3-8.6
> 12 mnths	332	13.8	11.2-16.3	25	7.0	4.0-10.1
Missing	69			5		
Reason for last visit						
Holidays	1,756	75.0	70.5-79.5	211	78.2	73.0-83.4
Visiting family/ Friends	551	18.7	13.0-24.3	37	12.9	7.0-18.8
Work	172	8.4	6.7-10.0	21	7.8	4.0-11.7
Other	193	6.9	5.2-8.7	29	10.1	4.9-15.4
Missing	29			1		

3.9 Pregnant women

In the NS 2.9% and in the LVCS 4.5% women were pregnant at the time of inclusion (Table 3.24). According to CBS data (2007) we would expect at least 5.5% pregnant female participants (181,336 live births from 3,281858 women aged 15-45 years).

Table 3.24 Pregnancy of female participants aged 19-44* years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	33	2.9	2.0-3.9	16	4.5	2.0-7.1
missing	3			2		

* In both samples no women younger than 19 and older than 44 years of age reported to be pregnant

their military passport to the blood clinic. The number of participants reporting they have served military service is listed in Table 3.21.

Table 3.21 Military service of participants aged 17*-79 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
In military service	717	17.4	15.7-19.1	179	18.8	13.5-24.1

*One can join the military service in the Netherlands from 17 years old

About 25% (NS) and 21% (LVCS) of the participants has been vaccinated because of their profession(s) (Table 3.22). Participants could have received vaccinations related to more than one profession. Most participants reported they had received vaccinations in military service. The percentage of participants who reported to have received vaccinations in military service (12%) is somewhat less than the percentage of participants who reported to have joined military service (17%). Most reported answer by other profession was travelling for work to a foreign country (58 and 11 times in both samples).

Table 3.22 Having been vaccinated because of their profession for participants aged 15-79 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes	1,077	25.2	23.4-27.1	206	20.9	16.6-25.1
Military service	485	11.6	10.1-13.1	114	11.7	8.4-15.1
(para)medical	415	9.6	8.5-10.6	61	5.7	4.8-6.6
Other	239	5.5	4.8-6.3	36	3.8	2.2-5.3
No	3,248	74.8	72.9-76.6	767	79.1	74.9-83.4
Missing	129			38		

3.8 Travelling data of participants

Most participants have never travelled to Asia, Africa or South/Middle America (Table 3.23). Of the participants who had travelled, most went to Asia. Most participants went for holidays and reported the duration of the visit was less than six weeks. Most reported answer by other reason for last visit was going to their country of birth (44 times) and military service (10 times) in the NS and LVCS, respectively. Note participants could have travelled to more than one part of the world and could have more than one reason for their journey.

Visited GP						
Yes	757	16.8	14.8-18.7	148	15.3	12.8-17.8
No	3,281	83.2	81.3-85.2	710	84.7	82.2-87.2
Missing	59			17		
No. days reported sick	719	4.1 (mean no.)	3.5-4.8	124	3.5 (mean no.)	2.7-4.4
Missing	119			16		
Work loss						
Yes	252	38.4	33.8-43.1	43	45.8	33.7-57.9
No	435	61.6	56.9-66.2	79	54.2	42.1-66.3
Missing	32			2		
Work loss yes						
Paid	214	90.1	86.2-93.9	36	83.7	68.9-98.5
Not paid	22	9.9	6.1-13.8	5	16.3	1.5-31.1
Missing	16			2		

3.6 General features of the participants

Crowding and contact with children are important factors in the spread of infectious diseases. To have some indication on this aspect we informed about household and day-care contacts (Table 3.20). The mean size of the household is 3.2 in the NS, which was somewhat larger in the LVCS. However, both samples seem to have a larger mean household size than found by the CBS (2.3 people per household in January 2007). Maybe this could have been caused by the lower percentage of singles in our study population. Furthermore, Table 3.20 shows that more children attend a day-care centre in the NS compared to the LVCS.

Table 3.20 General features of the participants

	NS			LVCS		
	N	**Mean no.**	**95% CI**	**N**	**Mean no.**	**95% CI**
No. persons in household*	6,305	3.2	3.1-3.3	1,513	3.9	3.7-4.2
Missing	43			4		
No. rooms in house**	6,288	4.7	4.6-4.8	1,510	5.1	4.9-5.3
Missing	60			7		
No. children household visiting day-care	344	4.4	4.0-4.9	70	2.9	1.9-3.9
Missing	1256			448		

*in NS range: 1-12, 15, 16, 20, 23 and 34 and in LVCS range is 1-14
**in NS range is 1-16, 18, 19, 25 and 35 and in LVCS range is 1-13

3.7 Military service

Upon entry in military service (men/women older than 17 years) many vaccinations are given. Data on which vaccinations were given are recorded in a military passport. Participants were asked to also bring

Table 3.19 Acute symptoms during last month reported by participants

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Diarrhoea						
Yes	957	15.8	14.8-16.9	207	13.6	11.1-16.2
No	4,763	83.5	82.4-84.6	1,143	85.9	83.3-88.5
Don't know	42	0.7	0.4-0.9	6	0.5	0.00-1.0
Missing	586			161		
Vomiting						
Yes	283	4.3	3.6-5.0	71	4.5	2.7-6.4
No	5,304	95.4	94.6-96.3	1,249	95.3	93.4-97.2
Don't know	18	0.3	0.04-0.5	4	0.2	0.00-0.5
Missing	743			193		
Fever						
Yes	680	10.2	9.3-11.2	170	8.9	6.3-11.5
No	4,895	87.9	86.8-89.0	1,155	90.2	87.8-92.7
Don't know	99	1.8	1.4-2.3	10	0.9	0.4-1.4
Missing	674			182		
Nauseous						
Yes	1,008	17.5	16.4-18.6	195	15.0	11.9-18.1
No	4,523	80.0	79.8-82.1	1,090	84.0	80.8-87.2
Don't know	121	1.5	1.3-1.8	32	1.0	0.6-1.5
Missing	696			200		
Pain in stomach						
Yes	1,696	28.5	27.0-29.9	330	24.1	20.4-27.8
No	3,945	70.6	69.1-72.0	982	74.9	71.1-78.7
Don't know	83	1.0	0.8-1.2	28	1.0	0.5-1.5
Missing	624			177		
Blood in excrements						
Yes	108	2.1	1.7-2.4	12	1.2	0.7-1.7
No	5,398	96.9	96.4-97.3	1,280	98.2	97.6-98.7
Don't know	59	1.1	0.8-1.4	10	0.7	0.3-1.0
Missing	783			215		
Mucus in excrements						
Yes	187	3.0	2.5-3.5	36	2.6	1.6-3.6
No	5,233	94.5	93.8-95.2	1,246	95.9	94.7-97.1
Don't know	142	2.5	2.1-2.9	22	1.5	0.7-2.3
Missing	786			213		
Coughing						
Yes	1,934	31.0	29.0-33.0	337	22.3	16.0-28.6
No	3,844	68.6	66.5-70.6	1,000	77.3	70.9-83.7
Don't know	25	0.5	0.3-0.6	8	0.4	0.00-0.8
Missing	545			172		
Running nose						
Yes	2,945	48.6	46.2-50.9	590	39.0	31.0-47.0
No	2,952	51.1	48.8-53.3	800	60.9	52.8-68.9
Don't know	23	0.4	0.2-0.6	2	0.1	0.00-0.4
Missing	428			125		

Table 3.18 Chronic diseases or allergies reported by participants

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Asthma or COPD	415	6.4	5.8-7.1	101	6.7	3.7-9.6
Hay fever	855	14.7	13.4-16.1	168	13.0	11.4-14.7
Eczema	657	10.5	9.6-11.3	155	10.1	7.4-12.8
Food allergy	366	5.6	5.0-6.3	58	3.4	2.2-4.5
Milk	116	29.5	24.1-34.8	28	39.7	25.7-53.7
missing	3				2	
Egg	20	5.2	2.9-7.5	3	5.4	0.00-14.1
Peanut	52	13.1	9.1-17.1	11	19.1	5.7-32.4
Nuts	65	18.4	13.7-23.1	10	21.4	5.8-36.9
Fish	18	4.9	2.8-7.0	2	2.1	0.00-7.1
Crustacean	34	9.5	6.4-12.6	2	2.1	0.00-7.1
Soya	14	3.7	1.8-5.6	3	4.8	0.00-10.6
Cereal products	35	8.5	6.0-11.1	4	4.8	0.00-14.2
missing	0				0	
Other food allergy	154	43.2	37.9-48.5	18	39.0	26.1-51.9
Other allergy	428	6.9	6.1-7.6	68	4.7	3.5-5.8
missing	20			2		
None	4,316	68.8	67.1-70.4	1,066	71.2	69.0-73.4
Missing	115			33		
Diagnosed by GP						
Yes	1,544	82.2	80.4-84.0	336	84.4	78.0-90.7
Asthma or COPD	369	23.3	20.8-25.8	92	26.1	18.7-33.6
Hay fever	598	41.2	38.4-44.1	111	38.4	32.5-44.2
Eczema	529	34.1	31.5-36.7	123	34.8	26.0-43.6
Food allergy	175	10.4	8.5-12.3	28	5.9	3.4-8.4
Other allergy	275	17.8	15.7-20.0	41	13.0	7.7-18.3
missing	12			0		
No	320	17.8	16.0-19.6	66	15.6	9.3-22.0
Missing	71			17		

The number of participants suffering from several acute symptoms during the last month is listed in Table 3.19. It was possible to report more than one acute symptom. CBS (2007) found that the percentage of reported diarrhoea and vomiting during the last two months by persons of 12 years and older was 10% and 3% respectively, which was somewhat higher for diarrhoea but similar for vomiting in both samples (15% and 3% and 13% and 4% in respectively the NS and the LVCS). Note that in P2 the acute symptoms during the last month in stead of the last two months have been asked.

percentage of participants who reported their own health was very good was 47%, good 45% and fair 8%, which was 43%, 49% and 8% in the LVCS. The CBS found that 26% of the Dutch population (all ages, 2007) reported that their own health was very good, 55% reported it was good and 19% reported it was fair. Note the classification of own health in general from five categories into three categories could have caused part of the difference in distribution of this variable between the two samples and CBS data.

Table 3.17 Opinion on their own state of health

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Excellent	1,350	21.4	20.2-22.6	349	21.5	17.2-25.9
Very good	1,591	25.8	24.3-27.2	336	21.8	20.1-23.6
Good	2,805	44.9	43.2-46.5	698	48.9	46.2-51.5
Fair	510	7.4	6.7-8.2	119	7.5	5.2-9.7
Bad	44	0.6	0.3-0.8	5	0.3	0.00-0.6
Missing	48			10		

In the questionnaire the participants could state whether they suffered from certain chronic diseases or allergies and whether this was confirmed by a GP (see Table 3.18). It was possible to report more than one chronic disease/allergy. In both samples about 70% of the participants reported no chronic diseases or allergies. Most cases of chronic diseases/allergies were diagnosed and confirmed by a GP (about 80%). Most reported chronic disease/allergy was hay fever.

CBS (2007) found that the percentage of persons (0+) who reported having asthma/COPD, chronic eczema or psoriasis or having had one of these chronic diseases during last twelve months was 7.2%, 4.4% and 1.5%, respectively. In both samples the percentage of persons reporting chronic eczema was higher, the percentage of persons reporting asthma/COPD was similar and the percentage of persons reporting psoriasis was lower (0.2% in both samples). Note that in P2 it was asked whether the participant has a chronic disease and not whether they had had a chronic disease during last twelve months. Also only participants of 79 years and younger were included in the P2 study. Most frequently given answer by other allergy was contact dermatitis in both samples (145 and 16 times). Other allergy diagnosed by GP was mainly contact dermatitis in NS (51 times) and bronchitis in LVCS (10 times).

Table 3.16 Immunization against hepatitis B per age group

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes						
0-14	223	11.1	8.2-14.0	19	3.0	1.0-5.0
15-79	605	14.2	12.8-15.6	88	8.3	5.8-10.8
<12 mnths ago						
0-14	54	28.2	18.5-37.9	4	19.2	0.9-37.4
15-79	95	16.2	13.4-19.0	18	26.3	12.9-39.7
1 to 5 yrs ago						
0-14	69	37.4	21.0-45.8	7	33.8	0.00-77.7
15-79	201	37.0	32.0-42.0	29	35.0	19.9-50.1
5 to 10 yrs ago						
0-14	16	12.3	6.4-18.3	2	21.2	0.00-42.6
15-79	144	26.0	21.9-30.1	16	20.5	13.6-27.5
Over 10 yrs ago						
0-14	3	2.3	0.00-5.0	0		
10 to 15 yrs ago						
15-79	47	8.2	5.8-10.6	4	5.3	0.00-13.6
15 to 20 yrs ago						
15-79	40	6.9	4.6-9.1	1	0.5	0.00-1.5
Over 20 yrs ago						
15-79	38	5.7	3.8-7.6	10	12.4	2.2-22.6
Don't know						
0-14	33	19.8	11.8-27.8	3	25.8	0.00-61.5
Missing						
0-14	48			3		
15-79	40			10		
No						
0-14	1,339	75.7	69.1-82.2	439	90.8	85.9-95.7
15-79	2,942	68.4	66.7-70.2	757	78.6	74.6-82.6
Don't know						
0-14	231	13.2	8.8-17.7	28	6.2	1.7-10.6
15-79	746	17.4	15.8-19.0	121	13.1	11.4-14.8
Missing						
0-14	101			20		
15-79	161			45		

3.5 State of health

In both samples most persons reported to have a good health (Table 3.17). Minor differences in the distributions were found between the two samples. For comparison with CBS data the category excellent was added to category very good and the category bad to the category fair. In the NS the

Table 3.15 Immunization against hepatitis A per age group

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Yes						
0-14	227	13.1	8.4-17.9	18	4.1	1.2-7.0
15-79	1,095	25.8	23.8-27.8	127	13.1	10.1-16.0
<12 mnths ago						
0-14	43	23.4	15.0-31.8	4	22.7	0.00-46.8
15-79	175	17.7	15.3-20.2	19	18.0	10.0-25.9
1 to 5 yrs ago						
0-14	93	50.7	42.3-59.0	8	48.0	10.1-85.8
15-79	452	43.7	40.8-46.6	48	37.7	27.6-47.8
5 to 10 yrs ago						
0-14	14	8.8	3.7-13.8	0		
15-79	195	19.3	16.6-21.9	25	23.5	11.5-35.5
Over 10 yrs ago						
0-14	1	0.7	0.00-2.3	0		
10 to 15 yrs ago						
15-79	102	10.0	8.3-11.6	12	8.8	4.0-13.7
15 to 20 yrs ago						
15-79	32	3.1	1.9-4.3	3	2.4	0.00-6.1
Over 20 yrs ago						
15-79	72	6.2	4.3-8.1	12	9.7	0.6-18.7
Don't know						
0-14	33	16.4	10.0-22.9	4	29.3	3.8-54.8
Missing						
0-14	43			2		
15-79	67			8		
No						
0-14	1,482	80.0	72.8-87.1	459	92.7	86.8-98.7
15-79	2,653	61.4	58.8-63.9	756	76.7	71.9-81.4
Don't know						
0-14	125	6.9	4.1-9.7	16	3.2	0.00-6.7
15-79	568	12.9	11.5-14.3	101	10.3	7.7-12.9
Missing						
0-14	60			13		
15-79	138			27		

3.4.4 Hepatitis B vaccination

In the NS 11% of the children reported that they had received that vaccination and 14% of the adults (Table 3.16). In the LVCS this percentage was 3% and 8% for the children and adults, respectively. Most participants had received the vaccination 1 to 5 years ago. The overall percentage of participants (0-79 years) who had received a hepatitis B vaccination was respectively 13% and 7% in both samples.

3.4.2 Latest DTP (re)vaccination

Diphtheria and tetanus vaccination was already administered to Dutch citizens in 1952. From 1962 DT was combined with IPV. DT-IPV was administered to men joining the military service, to people with professions with a higher risk at infection like (para)medics and to travellers. Sixty five percent of the participants (15-79 years) in the NS reported they have been vaccinated against DT-IPV and 57% in the LVCS (Table 3.14). When asking whether the participant has been vaccinated because of its profession the percentages were lower, which was probably due to extra vaccinations related to travelling (see also Table 3.22). Most of the participants reported that they received their latest vaccination over 20 years ago.

Table 3.14 Latest DTP (re)vaccination for participants aged 15-79 years old

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Not applicable, not vaccinated	601	13.6	12.5-14.8	266	26.5	16.9-36.1
Applicable, vaccinated	2,641	65.2	63.4-66.9	504	56.9	48.6-65.1
<12 mnths ago	153	6.0	5.1-6.9	27	5.4	3.3-7.5
1 to 5 yrs ago	546	20.4	18.7-22.0	79	14.8	10.2-19.3
5 to 10 yrs ago	444	16.3	14.9-17.6	49	9.9	7.3-12.6
10 to 15 yrs ago	331	12.4	11.0-13.8	75	13.5	10.4-16.5
15 to 20 yrs ago	185	7.0	6.0-8.0	53	10.8	8.2-13.3
Over 20 yrs ago	982	38.0	36.2-39.9	221	45.7	39.8-51.5
Don't know	932	21.2	19.7-22.8	158	16.7	12.1-21.3
Missing	280			83		

3.4.3 Hepatitis A vaccination

Of the children and adults in the NS 13% and 26% had reported they have been vaccinated against hepatitis A (Table 3.15). In the LVCS this percentage was 4% and 13% for the children and adults, respectively. Most of the children and adults reported that they had received the vaccination 1 to 5 years ago. The overall percentage of participants (0-79 years) who had received a hepatitis A vaccination was respectively 23% and 11% in both samples.

Table 3.13 Latest tetanus (re)vaccination because of an injury per age group

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Not applicable, not vaccinated						
0-14	1,525	81.0	75.2-86.2	454	88.8	87.5-90.0
15-79	1,886	41.8	40.4-43.2	501	49.4	44.7-54.1
Applicable, vaccinated						
0-14	144	9.2	6.8-11.7	29	7.9	4.0-11.8
15-79	1,710	41.4	39.8-43.0	339	36.1	30.4-41.8
<12 mnths ago						
0-14	27	17.7	12.1-23.3	9	21.8	4.3-39.3
15-79	71	4.2	3.0-5.3	17	5.0	1.3-8.6
1 to 5 yrs ago						
0-14	88	61.1	52.4-69.7	16	59.4	41.6-77.2
15-79	333	20.1	18.3-22.0	63	18.8	12.6-24.9
5 to 10 yrs ago						
0-14	29	21.2	12.9-29.5	3	14.8	0.00-30.5
15-79	327	19.3	17.8-20.9	51	15.1	12.3-17.9
Over 10 yrs ago						
0-14	0			1	4.0	0.00-12.2
10 to 15 yrs ago						
15-79	255	14.7	13.2-16.1	45	13.6	9.9-17.4
15 to 20 yrs ago						
15-79	203	12.2	10.3-14.2	42	13.0	8.8-17.1
Over 20 yrs ago						
15-79	521	29.4	27.4-31.5	121	34.6	25.2-43.9
Don't know						
0-14	167	9.8	6.3-13.3	13	3.3	0.3-6.3
15-79	738	16.8	15.5-18.0	135	14.6	12.0-17.1
Missing						
0-14	58			10		
15-79	120			36		
No. of wounds per person	1,365	3.3 (mean no.)	3.1-3.6	432	4.2 (mean no.)	3.5-4.9
Tetanus vac. because of wound						
Yes	35	2.6	1.6-3.5	13	3.5	1.4-5.7
No	1,308	97.4	96.5-98.4	411	96.5	94.3-98.6
Missing	22			8		

Table 3.12 Change in opinion on necessity of immunization in past five years for participants with a specific Protestant Christian belief

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
RB	71			326		
No	62	87.9	81.9-94.0	261	80.9	72.3-89.6
More inclined	6	7.0	1.8-12.2	26	8.7	3.9-13.5
Less inclined	1	2.5	0.00-6.8	20	5.0	2.1-8.0
Don't know	2	2.6	0.00-5.4	15	5.2	2.1-8.3
Missing	0			4		
RC	159			294		
No	123	78.0	69.4-86.7	239	82.9	77.1-88.7
More inclined	10	7.4	3.0-11.8	20	8.3	3.6-13.0
Less inclined	10	6.1	2.5-9.8	5	2.0	0.00-4.2
Don't know	13	8.4	3.8-13.1	21	6.8	4.2-9.4
Missing	3			9		
Other specific PC religion	1,132			450		
No	956	85.4	83.3-87.5	363	83.5	80.0-86.9
More inclined	84	7.6	5.8-9.5	39	9.2	6.6-11.8
Less inclined	23	2.1	1.2-2.9	16	2.3	0.3-4.3
Don't know	58	4.9	3.5-6.2	24	5.0	2.8-7.2
Missing	11			8		
Total	1,362			1,070		
No	1,141	84.7	82.5-86.9	863	82.6	78.9-86.3
More inclined	100	7.6	6.0-9.2	85	8.8	6.0-11.6
Less inclined	34	2.6	1.7-3.4	41	3.0	1.5-4.5
Don't know	73	5.2	3.7-6.6	60	5.6	4.1-7.0
Missing	14			21		

3.4 Other vaccinations

In this section vaccinations other than those received as part of the NIP are discussed. These are vaccinations against DTP (at older ages used for revaccination by travellers), tetanus (revaccination because of injury) and against hepatitis A and B (used by travellers, since 2003 hepatitis B in NIP for specials groups).

3.4.1 Latest tetanus (re)vaccination because of an injury

A tetanus vaccination outside the NIP (due to an injury) was given to 9% of the children (0-14 years) and 41% adults (15-79 years) in the NS, which was respectively 8% and 36% in the LVCS (Table 3.13). The supplement question on tetanus vaccination because of an injury later on in the questionnaire resulted in lower percentages. Probably participants also reported their tetanus vaccinations received in the NIP. Most children reported that they received the latest vaccination 1 to 5 years ago and most adults reported over 20 years ago. The overall percentage of participants (0-79 years) who reported they did get immunized against tetanus outside the NIP was 36% and 31% in respectively NS and LVCS.

In general the percentage of participants who had stated they had participated in the NIP was higher than the percentage of participants with vaccination data except for the RB individuals in the LVCS.

Table 3.11 Participation in the NIP and vaccination data present for different religious groups with a Protestant Christian belief* (0-55 years)

NS						
	N Participation NIP	%	95% CI	N Vac data present	%	95% CI
RB	60			60		
Yes	49	81.6	72.0-91.2	47	76.3	65.7-86.9
No	10	16.4	6.9-25.9	13	23.7	13.1-34.3
Don't know	1	2.0	0.00-6.3	NA		
Missing	0					
RC	128			128		
Yes	118	90.7	87.3-94.1	107	80.9	72.4-89.3
No	10	9.3	5.9-12.7	21	19.1	10.7-27.6
Don't know	0			NA		
Missing	0					
Other specific PC religion	757			757		
Yes	718	95.7	94.2-97.2	622	79.6	75.9-83.2
No	21	2.3	1.4-3.3	135	20.4	16.8-24.1
Don't know	14	2.0	0.7-3.2	NA		
Missing	4					
Total	945			945		
Yes	885	94.1	92.6-95.7	776	79.5	76.3-82.8
No	41	4.1	2.7-5.6	169	20.5	17.2-23.7
Don't know	15	1.7	0.7-2.8	NA		
Missing	4					
LVCS						
RB	285			285		
Yes	96	28.0	19.4-36.6	122	36.0	25.8-46.2
No	184	69.8	58.6-80.9	163	64.0	53.8-74.2
Don't know	5	2.3	0.00-5.5	NA		
Missing	0					
RC	215			215		
Yes	158	69.3	51.7-86.9	151	62.0	47.4-76.7
No	48	25.4	8.6-42.3	64	38.0	23.3-52.6
Don't know	8	5.2	1.7-8.8	NA		
Missing	1					
Other specific PC religion	321			321		
Yes	282	84.1	75.5-92.8	273	77.4	68.9-85.9
No	17	7.4	1.1-13.8	48	22.6	14.1-31.1
Don't know	18	8.4	4.6-12.3	NA		
Missing	4					
Total	821			821		
Yes	536	62.1	50.7-73.5	546	60.0	52.2-67.8
No	249	32.3	20.6-44.0	275	40.0	32.2-47.8
Don't know	31	5.6	4.1-7.1	NA		
Missing	5					

*RB: Reformed congregations, Reformed congregations in the Netherlands and Old reformed congregations. RC: Reformed bond within PKN and Reaffirmed reformed church. Other PC religion: rest.

The opinion on the necessity of vaccinations had not changed for most participants with a specific PC belief in both samples in the last five years (Table 3.12). Furthermore a larger percentage feels more inclined than less inclined compared to five years ago, both in the NS and in the LVCS.

Table 3.10 Reported religion of participants, specified for the Protestant Christian belief

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Protestant Christian:	1,470	23.4	17.7-29.1	1,143	74.5	63.5-85.6
Reformed bond within PKN	97	7.3	3.9-10.7	140	14.6	5.1-24.0
PKN, not reformed bond	777	57.4	51.5-63.4	387	37.3	30.0-44.6
Reaffirmed reformed church	62	4.3	1.7-6.9	154	14.3	4.5-24.1
Reformed congregations	61	4.4	2.3-6.4	223	18.6	12.6-24.6
Reformed congregations in the Netherlands	6	0.5	0.09-1.0	81	6.8	0.00-14.1
Old reformed congregations	4	0.4	0.00-1.0	22	2.4	0.00-6.3
Christian reformed churches	65	4.9	3.5-6.3	13	1.0	0.00-2.4
Reformed churches	81	6.2	4.2-8.2	9	1.0	0.04-2.0
Netherlands reformed churches	39	2.9	1.5-4.3	7	0.5	0.00-1.2
Pentecostal church and Gospel church	87	5.9	3.8-7.9	23	2.3	0.4-4.3
Mennonite Brotherhood	6	0.4	0.02-0.7	0		
Remonstrant Brotherhood	12	0.7	0.03-1.4	0		
Baptist congregations	28	2.2	1.2-3.3	0		
Other	37	2.5	1.3-3.7	11	1.1	0.5-1.7
Missing	108			73		
Roman Catholic	1,806	29.1	23.9-34.2	53	3.5	1.6-5.4
Islam	460	5.8	2.1-9.5	11	0.5	0.1-0.8
Jewish	5	0.1	0.01-0.1	0		
Buddhist	24	0.4	0.2-0.5	1	0.1	0.00-0.3
Hindu	84	0.6	0.2-1.1	0		
Other	239	3.6	2.9-4.2	28	1.7	0.9-2.5
No religion	2,212	37.1	32.9-41.3	273	19.7	10.8-28.6
Missing	48			8		

Participants were asked to state whether they participated in the NIP in their youth. The NIP in the Netherlands was introduced in 1957; however already from 1952 onwards vaccinations have been administered to the Dutch population. In the analysis on participation in the NIP therefore only participants less than 56 years of age were included. In the NS 92% of these participants reported they participated in the NIP, while this was 70% in the LVCS.
For the individuals aged less than 56 years and with vaccination data present 3.5% reported not to have participated in the NIP and 3.4% did not know whether he/she had participated in the NIP. This could be due to that the vaccination data only contained vaccinations not given within the NIP or to for example recall bias.

In the NS 82% of all RB participants had stated that they have participated in the NIP. For other PC religions this percentage was higher (>90%) (Table 3.11). Not surprisingly in the LVCS the percentage of RB participants who had stated they had participated in the NIP is lower compared to the NS.

Table 3.9 Distribution of educational level* per age group

NS[$]										
		Low			Middle			High		
	N (tot)	N	%	95%CI	N	%	95%CI	N	%	95%CI
0-14	1,866	202	10.8	3.4-18.1	911	48.7	44.1-53.3	753	40.5	34.4-46.7
15-79	4,401	526	9.6	8.2-10.9	2,225	50.9	46.9-54.9	1,650	39.6	35.6-43.5
Total	6,267	728	9.8	7.3-12.4	3,136	50.4	46.5-54.2	2,403	39.8	35.9-43.7
LVC[&]										
0-14	505	16	3.8	1.3-6.3	379	75.3	68.6-82.1	110	20.9	14.7-27.0
15-79	1,004	183	14.1	8.3-19.9	653	68.9	62.7-75.1	168	17.0	11.6-22.4
Total	1,509	199	12.1	7.7-16.6	1,032	70.1	64.4-75.8	278	17.7	12.6-22.9

*Low educational level includes no education and primary education, middle educational level includes junior technical school, lower general secondary education and intermediate vocational education and high educational level includes senior/higher secondary education, pre-university education and university
$Missing 0-14: 28 and 15-79: 53
&Missing 0-14: 1 and 15-79: 7

3.3.6 Religion

In the NS 23% of the persons of 18 years and older considered themselves PC, which was 19% by CBS (2007) and 75% in the LVCS. Furthermore 29% considered themselves Roman Catholic, which was 28% by CBS and 4% in the LVCS, 10% had another religion, which was 10% and 2% in respectively CBS and LVCS and 37% had no religion, which was 43% and 20% in respectively CBS and LVCS. Table 3.10 shows the reported religions of the participants also specified for the Protestant Christian (PC) belief.

From the PC sub group in the NS 5.3% (n = 71) persons belonged to the RB, 11.6% (n = 159) to the RC and 83.1% (n = 1132) to another specific PC religion. Hundred and eight persons did not report their specific PC background. In the LVCS this was respectively 27.8% (n = 326), 28.9% (n = 294), 43.4% (n = 450) and 73 persons did not report their specific PC background.

Table 3.8 Native country parents and ethnicity

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Native country father						
Netherlands	5,081	84.2	77.3-91.1	1,473	97.8	96.3-99.3
Other	1,227	15.8	8.9-22.7	36	2.2	0.7-3.7
Missing	40			8		
Native country mother						
Netherlands	5,056	83.7	77.0-90.3	1,457	97.5	96.2-98.8
Other	1,256	16.3	9.7-23.0	48	2.5	1.2-3.8
Missing	36			12		
Ethnicity*						
Dutch	4,862	80.2	73.1-87.3	1,453	96.2	94.2-98.2
Moroccan and Turkish	442	8.8	7.1-10.4	47	3.1	1.1-5.1
Surinam and Aruba and Netherlands-Antilles	334	4.4	1.4-7.5	3	0.2	0.00-0.5
Other non-Western	352	2.9	0.3-5.5	3	0.1	0.00-0.3
Western	358	3.7	1.7-5.6	11	0.4	0.09-0.8
Generation						
First	799	50.5	39.5-61.5	21	36.3	23.3-49.4
Second	687	49.5	38.5-60.5	43	63.7	50.6-76.7

*The ethnicities other than Dutch contain both first and second generation migrants. Data from questionnaire and population registers of municipalities were combined. The ethnic origin of participants born in the Netherlands and of whom both parents were born in the Netherlands was defined as indigenous Dutch. The ethnic origin of participants of whom one or both parents were born abroad was defined as allochthonous. Countries of origin were either Western (Europe, North-America, Oceania, Indonesia or Japan) or non-Western (Africa, Latin-America or Asia excluding Indonesia and Japan), whereby Morocco, Turkey, Surinam, the Netherlands Antilles and Aruba were excluded from non-Western.

3.3.5 Educational level

The distribution of highest accomplished education level was classified into three categories; low, middle and high (Table 3.9). For the younger participants (0-14 years) the highest accomplished educational category of the mother was asked for. The educational level in the NS was similar for the children (0-14 years) and the adult group (15-79 years). In the LVCS the adults had a higher percentage of persons classified with a low educational level and a lower percentage of persons classified with a middle or high educational level compared to the younger participants. However, this difference disappeared when we looked at the distribution of educational level in participants aged 20-50 years, resembling the parents of the 0-14 year-olds, in stead of 15-79 years. For comparison with CBS data (2005 and for 15-64 year-olds) low educational level did not include no education. In the NS 6% had a low, 51% a middle and 43% a high educational level compared to respectively 9%, 55% and 36% found by CBS.

Table 3.7 Nationality* and native country

NS	Nationality			Native country		
	N	%	95% CI	N	%	95% CI
Dutch	5,745	92.6	89.5-95.8	5,450	89.3	83.7-94.9
Turkish	127	1.7	0.6-2.7	111	1.5	0.3-2.8
Moroccan	101	1.3	0.04-2.6	93	1.4	0.00-2.9
Surinam	19	0.2	0.00-0.4	154	1.2	0.00-2.7
Aruba	9	0.1	0.01-0.2	15	0.1	0.01-0.3
Netherlands-Antilles	39	0.3	0.2-0.5	51	0.5	0.2-0.8
Other	250	3.8	2.9-4.7	413	6.0	4.5-7.4
Missing	58			61		
LVCS						
Dutch	1,491	99.4	98.9-100	1,465	98.3	97.3-99.2
Turkish						
Moroccan	2	0.1	0.00-0.4	2	0.1	0.00-0.4
Surinam	1	0.02	0.00-0.7			
Aruba						
Netherlands-Antilles	1	0.1	0.00-0.3			
Other	7	0.3	0.04-0.7	24	1.6	0.7-2.5
Missing	15			26		

*In the NS 55 persons reported both Turkish and Dutch, 54 persons Moroccan and Dutch, 10 persons Surinam and Dutch, 5 persons Aruba and Dutch, 14 persons Netherlands-Antilles and Dutch and 76 persons other nationality and Dutch. Further one person reported Surinam and other nationality, one person Netherlands-Antilles and Aruba, 2 persons Turkish and other nationality, one person Moroccan and other nationality, one person Surinam, Dutch and other nationality, one person Netherlands-Antilles, Netherlands and Aruba and one person Moroccan and Dutch and other nationality. In the LVCS only 1 person reported the Moroccan and Dutch nationality. The underlined nationalities were leading.

The CBS found that 80% of the Dutch population was indigenous Dutch, and the other ethnicities were respectively 9% other Western, 4% Moroccan and Turkish, 3% Surinam, Aruba and Netherlands Antilles, 4% other non-Western. In the NS (excluding the over sampled non-Western migrants) there were 86% indigenous Dutch persons, 9% other Western, 2% Moroccan and Turkish, 1% Surinam, Aruba and Netherlands Antilles and 2% other non-Western. In Table 3.8, the native country of father and mother, the ethnicity of participants (based on country of birth participant and both parents) and the frequency of first and second generation migrants were shown for the NS and LVCS.

Table 3.5 Distribution of net monthly income (NMI*) per household per age group

NS		Low NMI			Middle NMI			High NMI		
	N (tot)	N	%	95%CI	N	%	95%CI	N	%	95%CI
0-14**	1,497	277	17.9	9.8-26.0	854	56.9	51.7-62.2	366	25.2	19.4-30.9
15-79$	3,546	727	17.6	15.5-19.7	2,097	60.1	57.1-63.0	722	22.3	19.6-25.1
Total	5,043	1,004	17.7	14.5-20.9	2,951	59.3	56.2-62.5	1,088	23.0	19.9-26.1
LVCS										
0-14#	353	14	4.5	0.9-8.1	294	82.4	76.2-88.7	45	13.1	7.3-18.9
15-79^	738	168	18.0	13.4-22.6	484	69.0	61.9-76.2	86	12.9	8.2-17.7
Total	1,091	182	15.6	12.3-19.0	778	71.4	65.5-77.4	131	13.0	8.5-17.5

*Net monthly income was categorized as low (less than € 1.150 and less than € 1.167 by CBS), middle (€ 1.151 - € 3.050 and € 1.168 - € 2.917 by CBS) and high (more than € 3.051 and more than € 2.918 by CBS).
**Won't answer 0-14: 342 and missing: 55
$Won't answer 15-79: 769 and missing: 139
#Won't answer 0-14: 140 and missing 0-14: 13
^Won't answer 15-79: 232 and missing 15-79: 41

3.3.3 Marital status

Most participants reported to be married, with a higher percentage (73%) in LVCS than in NS (59%) (see Table 3.6). For comparison with CBS data, the option 'sharing house' was added to the option 'single'. In the NS about 58% is married, 32% single, 5% divorced and 4% widowed, which was 73%, 22%, 2% and 3% in the LVCS. The CBS found the following percentages for the Dutch population: married 53%, single 36%, divorced 4% and widowed 8%. Especially in the LVCS the percentage of married persons was much higher compared to the general Dutch population.

Table 3.6 Marital status of the participants aged 15 years and older

	NS			LVCS		
	N	%	95% CI	N	%	95% CI
Single	908	21.2	19.4-23.0	194	18.8	16.3-21.1
Sharing house	469	11.2	10.0-12.4	31	3.0	1.7-4.4
Married	2,546	58.5	56.1-60.8	691	72.5	68.5-76.6
Divorced	240	5.2	4.5-5.8	23	2.4	0.7-4.2
Widow(er)	227	3.9	3.4-4.5	52	3.3	1.3-5.3
Missing	64			20		

3.3.4 Nationality, native country and ethnicity

A participant could report more than one nationality; therefore below Table 3.7 the classification of persons with two or more nationalities is given. In the NS, German (9% (23/250)) is most frequently answered by other nationality and Indonesia (11.9% (45/413)) by other native country. The CBS found that on January 2007, 95.7% of the Dutch population had the Dutch nationality, 0.6% was Turkish, 0.5% was Moroccan, 0.05% had the Surinam nationality and 3.2% had another nationality. Due to the over sampling of migrants, the percentage of non-Western migrants was higher in the NS compared to the Dutch population. When excluding the non-Western migrants in the over sampling the distribution of nationality was 95.3% Dutch, 0.8% Turkish, 0.4% Moroccan, 0.05% Surinam, 3.5% other nationality. In the LVCS almost all participants have the Dutch nationality (Table 3.7).

In Figure 3.1 the number of participants per age group is shown for both men and women in the NS. It is clear that the number of participants in the age groups 0-4 and 5-9 years old was highest. Note that the number of invited persons in the age group 0-4 years old was twice as high as in the older age groups. While in the older age groups (except 70-79 years) females were slightly overrepresented, males were overrepresented in the younger age groups (0-9 years).

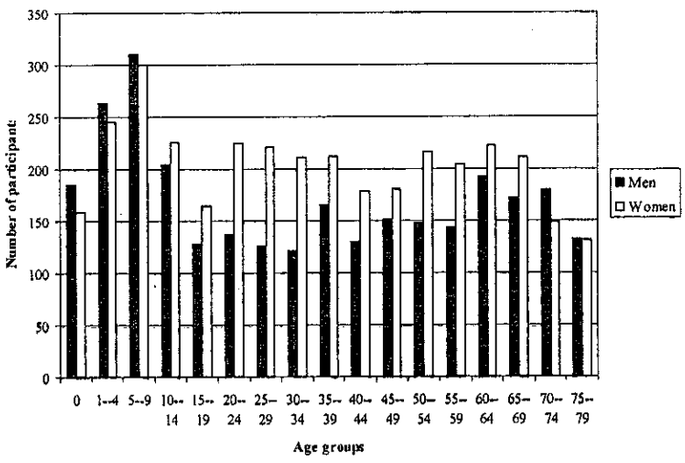

Figure3.1Number of participants per age stratum in the NS, stratified by gender

3.3.2 Net monthly income per household

In the NS the distribution of participants according to their net monthly income (NMI) was similar for the children and adult group, whereas in the LVCS more adult participants had a low NMI and less adult participants had a middle NMI compared to the children group (Table 3.5). The difference in the distribution of NMI between adult participants and the children group in the LVCS became less when we took only participants of 20-50 years old into account in the adult group, who resembled the parents of the 0-14 year-olds. The CBS found that 16% of the households in 2006 (most recent available data) could be denoted as having a low NMI, 54% a middle NMI and 31% a high NMI. In the NS the percentage of households with a high NMI was thus lower compared to CBS.

3.2.4 'Don't know' and 'Won't answer' answers

The questions that showed the most 'don't know' answers were for the 0-14 year-olds, how many times a person had suffered from a wound during the last month, 389 (22%) and 134 (28%) in respectively the NS and the LVCS. Also the question about having received a vaccination against hepatitis B scored a lot don't know answers for the 0-14 year-olds in the NS (231 (13%)).

For the 15-79 year-olds the question about having experienced chicken pox showed the most don't know answers, 1,291 (30%) and 308 (31%) in respectively the NS and the LVCS. Furthermore, the question on having received vaccination against tuberculosis showed a lot of don't know answers in the NS (1,156 (27%)) and the question on having suffered from a wound during the last month in the LVCS (276 (30%)).

The question that showed the most 'won't answer' answers was the question on the NMI per household, 19% (n = 342), 28% (n = 140) for the 0-14 year-olds and 18% (n = 769) and 24% (n = 232) for the 15-79 year-olds in respectively the NS and LVCS.

3.2.5 Questions mistaken

The most misinterpreted question was the question about what specific food allergy one might have. This question was part c of the main question (question 36) on having disorders (asthma/COPD, eczema, hay fever, food allergy, other allergy). Many persons had answered 'no' on the questions about lactose intolerance and gluten hypersensitivity without filling in they had an allergy for milk or grain products, probably because this part of the question was at the following page. It also happened that a certain disorder was diagnosed by the GP (part b of question 36) but that the participant did not report this disorder in the preceding question (part a of question 36). Furthermore, it was not clear what answer was expected at question 36b given the outcome of the open category. Both certain disorders and persons who had diagnosed the disorder were reported.

3.3 Demographic information

3.3.1 Distribution of gender

Table 3.4 Percentage of men among the participants per age group

NS				
	N (total)	N (men)	% men	95% CI
0 – 14	1,894	963	52.6	49.8-55.4
15 – 79	4,454	1,926	49.3	47.4-51.1
Total	6,348	2,889	50.1	48.6-51.5
LVCS				
0 – 14	506	279	51.2	46.4-56.0
15 – 79	1,011	455	49.8	46.7-53.0
Total	1,517	734	50.1	46.9-53.3

In the NS the mean percentage of participating men was somewhat lower in the adult group (15-79 years) compared to the children group (0-14 years) (Table 3.4). The percentage of men in the Dutch population on 1 January 2007 (CBS) is 51.2% for 0-14 year-olds, 49.8% for 15-79 year-olds and overall for men 50.1%.

Table 3.3 Who filled in the questionnaire per age group

NS	0 – 14 years	15 years and older
	N (%)	N (%)
Participant	96 (5.2%)	4,208 (96%)
Parents/caretakers	1,675 (90.5%)	33 (0.8%)
Other person	80 (4.3%)	89 (2.0%)
Child of participant	NA	53 (1.2%)
Missing	43	71
LVCS		
Participant	20 (4.0%)	960 (96.9%)
Parents/caretakers	484 (95.8%)	11 (1.1%)
Other person	1 (0.2%)	13 (1.3%)
Child of participant	NA	7 (0.7%)
Missing	1	20

3.2.2 Clarity of questions

In the NS in total 759 (12.0%, of which 320 (16.9%) 0-14 year-olds and 439 (9.8%) 15-79 year- olds) persons reported that one or more questions were not clear to them. The following questions were noted most frequently: number of conversations with persons in varying age groups (respectively 120 times for 0-14 year-olds and 106 times for 15-79 year-olds) and opinion on vaccination for persons aged 0-14 years (68 times) and previous experience with sexual transmitted diseases for persons aged 15-79 years (31 times). It was also reported that questions on being vegetarian, eating raw meat or unwashed vegetables were a bit strange in case the invitee was an infant. Furthermore, the question on how much time a child was playing in the sandbox was found to be difficult to answer as parents were not all the time present. Finally some invitees reported they were not familiar with vaccinations for hepatitis A and B.

In the LVCS in total 148 (9.8%, of which 65 (12.8%) 0-14 year-olds and 83 (8.2%) 15-79 year- olds) persons reported that one or more questions were not clear to them. Also in the LVCS the question on the number of conversations with persons in varying age groups was found most difficult to answer, respectively 27 and 20 times. It was also mentioned that the definition of a household member was not very clear and the word inclusive was found to be difficult.

3.2.3 Missing values

In both samples the question that showed the most missing values was the total number of persons one had a conversation with. In NS there were 387 (20%) and 473 (11%) missing values and in the LVCS 79 (16%) and 114 times (11%) for respectively 0-14 and 15-79 year-olds. Secondly, for persons 0-14 years old in the NS, the question on the maximum number of injections (340 (18%)) and in the LVCS the contact day and the reason for not vaccinating their child (both 59 (12%)) had the most missing values. For persons 15-79 years old in both samples the question on having had symptoms (e.g. diarrhoea, vomiting, fever et cetera, question 35a) during last month (332 (7%) - 583 (13%) in NS and 104 (10%) – 168 (17%) in LVCS) had the most missing values. Thirdly, for persons aged 0-14 years in the NS the question on the contact day (345 (18%)) and for persons aged 15-79 years in both samples how many times a person had suffered from a wound during the last month (469 (11%) in NS and 99 (10%) in LVCS) showed the most missing values.

In the NS, 6,386 persons donated a blood sample. Thirty five of those 6,386 had not filled in a questionnaire; however 4 of them did fill in a non-response questionnaire. A participant was defined as an invited person who participated in the P2 project and who gave blood and completed the original questionnaire. In the NS the number of participants was 6,348 (32%). In the LVCS the number of participants was 1,517 (35%), resulting in a total of 7,865 (33%) participants. Of the participants in the NS, 97% (n = 6,134) also gave a blood sample for DNA isolation and from 70% (n = 4,431) of the participants vaccination data were present. In the LVCS this was 96% (n = 1,462) and 59% (n = 895), respectively. In total 824 of the 1,162 (71%) diaries were completed of which 814 (99%) diaries were from participants. In Table 3.2 the number of participants in the two age groups is shown for the NS and LVCS.

Table 3.2 Number of participants per age group

	NS	LVCS
	N	N
0–14 years	1,894	506
15–79 years	4,454	1,011
0–79 years (total)	6,348	1,517

Some remarks that have to made: 1) the number of invited persons per municipality was not always exactly the number of persons imported in de database, which was due to deaths or relocations; 2) for municipalities with low inhabitant numbers (e.g. Renkum and Barneveld) there was a higher chance of inviting more than one person living at the same address, which happened several times; and 3) in the municipality Dordrecht the upper age in each age class was missing because the boundaries for the age groups were not set properly. (e.g. the age 4 was missing in the age group 1-4 years; the age 9 was missing in the age group 5-9 years et cetera). Unfortunately, there was no time to draw a new sample from the population register.

In total six complaint forms or letters were received at the RIVM. To each of the six individuals a personal letter was sent by the P2 project manager. Reasons for reporting the complaints were: blood sampling did not went well; despite a secret number the person was phoned by the call centre; an adverse event (stiff arm) after the blood sampling; and three times there was a misunderstanding about the appointment for the blood sampling (e.g. other location of the clinics, project team arrived too late due to traffic jam).

3.2 Questionnaire

This section describes whether the participant or a proxy filled in the questionnaire (Table 3.3). Furthermore, questions that had the most missing values, questions mistaken and proportion of 'don't know' answers are described.

3.2.1 Completing the questionnaire

Most of the questionnaires were completed by the invitee him/herself and in case the invitee was below 15 years old the questionnaire was completed by a parent or caretaker (see Table 3.3).

3 Results

In this report the weighted distribution of answer categories is shown for participants (i.e. persons with blood and a questionnaire) in the P2-project in the NS (including the over sampling of migrants) and in the LVCS.

3.1 Response in the P2-project

All municipalities, except one, and their PHS were willing to participate in the P2 project. Only the municipality 'Mook and Middelaar' did not want to participate. Therefore the next municipality on the list in that region, Heusden, was asked (and willing) to participate.

In total 24,291 persons were invited to participate. With 107 persons no contact could be made, mostly due to relocations and a in a few cases the person had died. Furthermore 37 persons were excluded because they were mentally disabled and therefore not eligible to participate in the study (exclusion criterion). In a few cases we were not convinced that the participated person was the invited person so we had to remove these materials. The following materials were removed:
6 times blood and a questionnaire, 6 times only blood, 26 times a questionnaire and 18 times a non-response questionnaire. In total 24,147 persons were taken into account in the calculation of the response rate. A responder was defined as a person who had visited the clinic for blood sampling irrespective blood sampling succeeded. The overall response was 33.5% (N = 8,089). Table 3.1 shows the number of materials collected.

Table 3.1 Materials obtained and response in the PIENTER2-project

	NS	LVCS
	N (%)	N (%)
Total invited	19,781	4,366
Total materials present of persons who visited the clinic:		
Blood and questionnaire	6,348 (32.1%)	1,517 (34.7%)
Blood no info questionnaire	38 (0.2%)	1 (0.02%)
DNA*	6,207 (31.4%)	1,469 (33.6%)
Questionnaire (visited consult)	135 (0.7%)	43 (1.0%)
Diary*	824 (4.2%)	NA
Vaccination booklet*	4,583 (23.2%)	932 (21.3%)
Only information from population register	7 (0.04%)	
Materials obtained otherwise:		
Questionnaire	1,200 (6.1%)	354 (8.1%)
Short questionnaire	1,652 (8.4%)	450 (10.3%)
Information population register	10,401 (52.6%)	2,001 (45.8%)

*these materials should not be included in the total number of invited persons

each migrant group and for migrant groups in urbanization degree 1 versus migrant groups in urbanization degrees 2-5.
For the analysis of seroprevalences, GMTs and questionnaire data, the data will be weighted by age, gender, ethnicity and urbanization degree to match the true population distribution in the Dutch population at 1st of January 2007. The variables age, ethnicity and urbanization degree were re-categorized to have weight factors between 0.25 and 4. Urbanization degree was now divided into two classes namely urbanization degree 1 and urbanization degrees 2 to 5. New age groups were made for the different countries of birth. For the Dutch inhabitants the following five age groups were defined: 0-9, 10-19, 20-39, 40-59 and 60-79 years. For the other Western migrants two age-groups were defined: 0-49 and 50-79 years. For each of the three non-Western migrant groups (Morocco and Turkey, Suriname and Aruba and Netherlands Antilles, other non-Western countries) the following three age groups were distinguished: 0-4, 5-49 and 50-79 years. No distinction could be made between first and second generation individuals due to too low numbers. We also adjusted for the two-stage cluster sampling by taking into account the strata (regions) and clusters (municipalities).

2.17.2 Low vaccination coverage sample

Overall and age-specific seroprevalences and GMTs will also be determined for the LVCS and for the ORIs who refuse vaccination based on religious grounds. To be able to compare the seroprevalences, GMTs and questionnaire data in the LVCS with those in the NS, the data will be weighted by age and gender according to the Dutch population (1st of January 2007). To have weight factors between 0.25 and 4, the variable age had to be re-categorized into fifteen instead of seventeen age strata by combining the age strata 0 and 1-4 years and the age strata 40-44 and 45-49 years. We also adjusted for the one stage cluster sampling by taking into account the clusters (municipalities).

2.18 Classifications of net monthly income, religion and education

In this study persons with a net monthly income (NMI) per household less than € 1,150, between € 1,151 and € 3,050, or more than € 3,050 were classified as persons with respectively a low, middle and a high NMI, according to Statistics Netherlands (CBS).
Furthermore ORIs are defined in this study as persons with one of the following specific Protestant Christian (PC) beliefs: Reformed bond within PKN, Reaffirmed reformed church, Reformed congregations, Reformed congregations in the Netherlands or Old reformed congregations. Within the group ORIs we distinguished Reformed Bond (RB) (Reformed bond within PKN and Reaffirmed reformed church) and Reformed Congregation (RC) (Reformed congregations, Reformed congregations in the Netherlands or Old reformed congregations).
Educational degree was classified as low (no education or primary education), middle (junior technical school, lower general or intermediate vocational secondary education) or high (higher vocational or higher general secondary education, pre-university or university education), according to CBS.

U number at the backside of the questionnaire was the same as was displayed in the data-entry database. If a questionnaire did not contain a sample number the questionnaire was entered via the U number.
Answers at supplement question(s) were entered in the database also in case the main question was not answered. After having entered a certain answer at a question in the database, the program turned automatically to the next question. Intermediate question(s) were therefore not entered in the database. The number zero was only entered if it was relevant like for example with age. If two answers were given but only one answer was allowed to, then the upper or first answer was taken, except for education where the highest education was taken. In case the years of birth of housemates were given, the age was calculated by subtracting the year of filling in the questionnaire from the year of birth. Regarding open questions, the answers were entered into the database as concise as possible.

The vaccination certificates were entered in the P2 database by several P2 team members and all vaccinations were checked once by the same P2 team members. All vaccinations given were recorded in de database by month and year. In the Statistical Package SAS (9.1.3 for Windows) the day of the vaccination date was automatically set at 15. When only the year of the vaccination date was available the month was set at December.

2.16 Data validation

A comparison of the variables date of birth and gender provided in the questionnaires and in the file of the population registers was done to select possible non-invited persons who did fill in the questionnaire and possibly donated blood (e.g. instead of a family member). When a discrepancy was found between the variables then the date of birth in the population register was considered the right one (the same was true for gender). Obtained DNA samples were removed if no consent was given at the intake form. The non-response questionnaires were removed if an invited person also had filled in the long questionnaire and if the person participated in the study. In case a person did not participate, the non-response questionnaire was kept for the extra information why the person did not want to take part in the study. In the latter case the questionnaire was leading.
Answers to questions that were not plausible (e.g. a man who is pregnant) or inconsistent (answering 14b but not 14a), wrong referenced answers (filling in a question when one should have skipped it on the basis of the answer on the previous question), or 'missed' answers (e.g. filling in eating daily raw meat but not have filled in eating raw meat at all) were checked in the questionnaire and corrected if possible. All adjustments were logged and signed according to GCP.

2.17 Data-analysis

Data will be analyzed in SAS. Procedure Surveyfreq will be used for calculating seroprevalences and procedure Surveymeans will be used for calculating geometric mean titres (GMTs).

2.17.1 Nationwide sample and migrants

Overall and age-specific seroprevalences and geometric mean titres will be determined for the general Dutch population for various diseases. The migrants who participated in the over sampling will be included in the analysis of the NS to increase the power, but their will be adjustment for their over representation. In case the number of participants is large enough, the seroprevalence will also be calculated by age, especially for the youngest age-strata. GMTs will be calculated taking both the positive and negative samples into account. The seroprevalence and GMT will also be determined for

2.12 Complaint procedure

In the information brochure (and in the invitation letter) a telephone number of the RIVM P2 project team was given. If necessary the participant could also approach the independent GP, who was not involved in the P2 project.
Complaints expressed at the clinic to the research assistant of the RIVM were passed through to the project manager. Complaints were registered at a special form and were tried to be solved at the clinic. If the complaint could not be solved at location then the project manager took further actions if necessary. The complaint procedure of the RIVM was applicable.

2.13 Public relations

The communication department of the RIVM advised the project team not to seek publicity in the national media at the start of the project in February 2006. Only a relatively small number of individuals would be invited, therefore it was thought that the effect of national media would be minor. Two weeks before the onset of the study in a municipality, the PHS informed GPs and the local health services in that particular municipality by a standard letter for the mediators. In addition, posters in various languages were sent to the PHS by the RIVM with an accompanied letter to distribute the posters in the municipality. Also, a standard press release was available for the local press or radio. In various municipalities the P2 project was mentioned or P2 project members were interviewed in the newspaper, at the radio and/or regional television. In January 2007 the project manager was interviewed for the national television (NOS).

2.14 Ethical issues and privacy

The study proposal was submitted to the Medical Ethical Testing Committee of the foundation of therapeutic evaluation of medicines (METC-STEG) in Almere and was approved (11th of October 2005) (clinical trial number: ISRCTN 20164309).
The P2 database was only accessible for the P2 team members. The samples drawn from the population registers and other documents containing participant data (call centre and printing office at RIVM) were saved at the server, which was only accessible for the members of the P2 team. Personal data received by email or by CD were destroyed after the data were saved at the server. The preparations for the mailing took place by a small team at the printing office at the RIVM. The telephone calls were made at the call centre and the files containing personal data were deleted after use.
All personal data had to be anonymous six months after the last clinic in a municipality. However, in some municipalities this period had to be extended because some municipalities were re-visited or information about the participants was needed to request vaccination certificates from the PEAs. The informed consents have been kept in a lockable fire-resistant safe during data collection and were thereafter archived within the RIVM for the period of minimal 15 years.

2.15 Data-entry

Questionnaires were entered via the website (https://webcollect.rivm.nl/PienterProject) in the data-entry database by an employee of an external company. All data were checked (100% control) by a second employee of the same company.
In general, the questionnaire was entered via the sample number and it was checked whether the

sexual active. The questionnaire was composed to gather information on personal details, vaccinations, state of health, any diseases they have had in the past, activities possibly related to infectious diseases, sexual history and sexual related diseases (only for 15-79 year-olds) and opinion on vaccination related topics (only for 0-14 year-olds). The questionnaire was supplemented with questions requested by other RIVM researchers. The experience from the P1 study as well as the information from the pilot for the P2 questionnaire was taken into account. There were no versions of the questionnaires available in other languages.

2.9 Non-response questionnaires

Non-response questionnaires were also composed in the same two versions as the questionnaire and covered the reason for non participation, date of birth, gender, marital status (for individuals of 15 years and older), country of birth and in case the invitee was not born in the Netherlands since when inhabitant in the Netherlands, level of education (level of education of mother for children below 15 years), religion, participation in NIP, state of health and what influences their opinion on vaccination.

2.10 Vaccination certificates

The information on the certificates is important for interpreting the results of the antibodies measured in the sera. The vaccination data are also used to verify some answers in the questionnaire. A copy of the type, date and number of vaccinations received was retrieved from the PEAs for those participants who could not hand over their vaccination data. Vaccination certificates that could be retrieved were for Amsterdam for participants born in or after 1963, for the province Gelderland (prepas) for participants from birth cohort 1968 and for the other PEAs for participants from birth cohort 1970-1974.

2.11 Serum isolation and storage

The blood samples collected at the clinics were kept at room temperature. At the end of the clinics all blood and DNA samples were transported to the RIVM and stored in a refrigerator (4 °C) overnight. All materials were registered by scanning the sample number in the central P2 database.
The DNA tubes and buccal swabs were stored in a freezer at -20 °C until further processing. The tubes with blood were centrifuged for 10 minutes at 2500 rpm, 15 °C in the Hettich Rotixa/p-centrifuge. The serum was divided into portions of 5 ml serum in a bio-safety cabinet thereby keeping the samples sterile and was stored at -80 oC. Barcodes were checked throughout the aliquot procedure. After the collection of samples was finished, one tube of serum per participant was thawed and aliquoted with a robot (Tecan 150) into 10 separate Micronic blocks with different volumes and stored at -80 °C until analysis. In case the volume was lower than 5 ml not all Micronic blocks could be filled. All available volumes were recorded into the P2 database. If more than 5 ml serum was available then the second (or third) tube remained stored for future use at -80 °C.

insufficient knowledge of the Dutch language), the questionnaire was completed in co-operation with a team member.

The vaccination certificates from the participants were photocopied and a personal sample number was attached to the copied certificate. If the participant forgot to bring the vaccination certificate(s) then he/she was asked to send a copy to the RIVM or a copy was retrieved from the PEAs.

In each of the 40 municipalities in the NS about 30 diaries were handed out during the regular clinics on Monday and Wednesday. There were three versions of the diary for: children (0-8 years), teenagers (9-17 years) and adults (18 years and older). Six diaries were handed out in the first two age groups and 18 diaries were handed out in the adult group. The participant was asked to record the number of conversations he/she had during a certain day of the week. If the participant refused to participate, the next participant in the same age group was asked. The diary was also marked with the personal sample number.

After the intake, three tubes of 10 ml blood volume (for children between 5 and 12 years old 2-3 tubes of 10 ml blood volume and for children younger than 5 years old, 2 (maximum 4) tubes of 5 ml blood volume) were taken from each participant and marked with the personal sample numbers. If participants had agreed to participate in the additional DNA research then for children younger than 5 years a buccal swab was taken and for individuals older than 5 years an extra EDTA tube of 2.5 ml blood volume was taken, again marked with the personal sample number.

Participants were offered a gift voucher of €10 as a token of gratitude and children also received a small present. The participant signed for receipt (hard copy). At each clinic all obtained materials were registered in the computer.

The team consisted of three external medical workers and one research assistant of the RIVM. The main task of the external medical workers was drawing blood but often one of them had an administrative task and was helping the research assistant. There were two teams of three external medical workers who alternated each other every week except for the extra clinic the following week so that in general the same team was cooperating in one municipality. Depending on the number of invitees extra external personnel or personnel from the RIVM could stand in.

The materials present at the clinics are described in Appendix 8.

2.7 Location clinics

The location for the blood sampling was arranged by the RIVM in cooperation with the PHS. This could be at the PHS itself if located in the selected municipality or in any other appropriate building in that municipality. The criteria for the location are given in Appendix 9.
In general the P2 clinics were held at well known locations. For larger cities a number of clinics were planned at different locations spread throughout the cities and as close as possible to most invitees.

2.8 Questionnaires

There were two versions of the questionnaire, one for 0-14 year-olds (A) and one for 15-79 year-olds (B) with relevant questions for these age groups (see Appendix 10 and 11). As a consequence no sexual related information is gathered among 13 and 14 year-olds despite the fact that they might be already

Persons, who had not shown up at the clinic and had stated that they intended to come, were approached again to invite them to the extra clinic one week later, which was mostly on Tuesday. Also individuals who could not be reached by phone before the regular clinics and who had not responded were approached again. Persons who refused to come to the extra clinic were asked to fill in the questionnaire and in a second instance to fill in the non-response questionnaire (by phone or mail). Individuals, who could not be reached by phone after three attempts, were sent a written reminder letter and the short non-response questionnaire.

The approach of all invited persons summarized:

Days before/after clinic

- Sending mailing package -14 days
- Reminder by phone (or mail) -(5-7) days
- Start of clinics 0 days
- Non-response by phone (or mail) + 1 day
- Start of extra clinic +8/6 days

2.6 Clinic

The clinics were planned weekly, with the exceptions of holidays, in the period of February 2006 until June 2007. Appointments were made in general on Mondays and Wednesdays from 13.00 a.m. to 7.00 p.m. but individuals were allowed to come in until 7.30 p.m. at the open house clinic or in second instance at their own preferred time. One day in the following week an extra clinic was planned from 6.00 p.m. to 7.00 p.m. (variable time). Half way the project all clinics in a municipality were mentioned in the invitation letter so that if the appointment was not convenient, the participants could come at their own preferred time. The duration of the clinic and the number of clinics were in consultation with the municipalities.
The personal data of the invitees were downloaded to laptops. At the site wireless contact with the database at the RIVM was possible when needed. All study materials were also available at the site to change to hard copy in case of computer failure.
Participants were called in order of entry of the waiting room. Firstly, several questions were asked to verify that the participant was the invited person and did meet all inclusion criteria and the participant was asked for its informed consent. Secondly, the participant was registered in the database. An unique sample number was assigned to the participant, coupled to the U number, and scanned in the database. Subsequently a sticker with this sample number was put on all materials received from the participant. Both in the database and at the questionnaire the sample number was coupled to the U number of the participant. Thereafter, questions from the participant were answered and remarks could be made. The participant could also state whether he/she was willing to participate in the additional DNA sub study. The informed consent was checked whether this option was signed for. According to the Dutch law, both parents had to sign the informed consent in case a participant was under eighteen. Furthermore all participants over the age of twelve had to sign the informed consent. A member of the P2 project team also signed the informed consent showing the investigators were committed to perform the study according to the protocol.

The questionnaire was checked on completeness and the registered sample number was attached to the questionnaire. If necessary, missing or unclear answers were clarified, except when it concerned a question on diagnosis of sexual transmittable diseases or sexual history in order not to discomfort the participant. If the participant had been unable to fill in the questionnaire him/herself (e.g. migrants with

2.5 Approach of the participants

Participants received two weeks prior to the prescheduled appointment time for blood donation an invitation package by mail including the invitation letter, a brochure containing information on the study, a questionnaire and an informed consent form. Three versions of invitation letters were available: for persons of 0-14 years, 15-18 years and 19-79 years. A full translation of the letter in Turkish was available. This translated letter together with the Dutch letter was sent to individuals born in Turkey and to Dutch children aged 0-14 years old with one of their parents born in Turkey. Part of the invitation letter was also translated in Arabian, French and English (added into one letter) and was sent together with the Dutch letter to all individuals born in a foreign country (except Turkey) and to Dutch children aged 0-14 years old with one of their parents born in a foreign country (except Turkey). On the invitation letter the initials, family name, address, town of the invited person were given. Initially no date of birth was mentioned however after some confusion with participants with identical initials and same address, the date of birth was included (best is in the letter and not in the address window). The letter contained a special P2 logo, a logo of 'GGD Nederland', which is the umbrella organization of all PHSs, and a logo of the RIVM. The letter was signed by the director of Centre for infectious disease control (CIb) at the RIVM. An unique individual number (U number) was assigned to every invited person, which was printed on the invitation letter. Also the date, time of the appointment and the address of the location of the clinic was printed on the invitation letter.
In some municipalities with a large number of (invited) migrants, the mailing package also contained a flyer to clarify the contents of the letter by visualization. On this flyer three photographs were shown of: 1) taking a blood sample; 2) filling in the questionnaire; and
3) receiving the gift voucher. Also present on the flyer were the dates, time and addresses of the clinics on one side and a street map and photographs of the locations of the clinics on the other side.

The invited persons were asked to complete the questionnaire at home and to visit the special clinic to donate a blood sample. In addition, for the DNA research, individuals older than 5 years were asked to give one more extra blood sample and children less than 5 years were asked for a buccal swab. About 1000 participants of the NS were asked to fill in a diary (see Appendix 6). Participants had also been asked to bring their immunization certificates to the clinic.

With help of a planning tool in the P2 database (see Tables A7.1 and A7.2), individual appointments were proposed at times when it would suit individuals best; school-going children were invited after school hours, individuals probably having jobs were invited in the late afternoon or in the evening and older individuals (>65 years) and the youngest children (0-4 years old) had appointments in the early afternoon. Turkish and Moroccan individuals were invited at days when translators (own language and culture) were appointed. These measures were taken to enhance the response in these groups. However, after several municipalities we noticed that these efforts were not needed.

One week before the clinics in a municipality, all invited persons were approached by phone by a call centre to ask if they were willing to participate, to answer their questions, and to remind them of the study. When individuals refused to participate, they were asked to complete the questionnaire and if they also refused this, to answer some questions for the non-response survey (by telephone or by mail). When individuals were unable to come at the proposed time of appointment, they were offered an alternative: the open house clinic in the evening, the extra clinic the week after the regular hours or during the regular hours. Individuals who could not be reached by phone after three attempts were sent a written reminder card. This card was sent four of five days before the start of the first clinic in a municipality. For more information on the P2 project individuals could call the telephone number of the P2 project provided in the invitation letter and in the brochure. The telephone was staffed by a member of the P2 team at working days from 9.00 a.m. till 16.00 p.m. and half way the project from 9.00 a.m. till 12.00 p.m. If the telephone was not staffed by a member of the P2 team then the voice mail was on.

The third sub study aims to estimate the seroprevalence of food allergies and to investigate the suggested association of vaccination with (reported) allergies.[4] A special question on having disorders (e.g. COPD/asthma, eczema, hay fever, food allergy (and which specific food allergy) and other allergies) and whether these disorders were diagnosed by the GP was included in the questionnaire.

2.3 Co-operation with Public Health Services

The Public Health Services (PHSs) were essential partners in this project as they are a well known organization for the general population in their region. The data collection was carried out per PHS and covered a period of 17 months (February 2006 – June 2007). The PHSs were visited in a random order so that regions were mixed. All municipalities belonging to the same PHS were visited after each other. In November 2006 all PHSs received a letter kindly requesting their participation in the P2 project. All PHSs were willing to participate and a co-operation contract was sent. Thereafter additional information was sent about the global planning of the blood clinics and the number of individuals to be invited in each municipality. Each PHS was contacted by telephone about nine months before the data collection in that particular municipality (or region) started. In this telephone call the following subjects were covered: background of the P2 project, activities expected of the PHS (see Appendix 4 for details about these activities), possible locations in the selected municipality (or village or city) for the clinics, contact person of the municipality, time schedule and local PR activities. After the telephone call a binder containing all the study materials of the P2 project was sent. See Appendix 5 for these study materials.

2.4 Co-operation with municipalities

After receiving the name of the contact person of a municipality from the PHS and at least 6 months before the first sampling started in the municipality a telephone call was made. In this telephone call the following subjects were covered: background P2 project, participation of municipality, time schedule of drawing sample from population register, type of sample(s) drawn (NS and/or over sampling of migrants, LVCS), and if assistance was required with drawing of sample. After the telephone call a letter explaining in detail the sample procedure and a letter with some background information on the P2 project was sent. A few weeks later the municipality was called again asking if they were willing to participate. The person from the municipality and the RIVM had direct contact on the sampling survey without mediation of the PHS. In case the RIVM was drawing the sample, the data from the municipality (e.g. PC-dump of population register) had to include an identification number (A-number) and date of birth of the participants. In case migrants had to be over sampled also country of birth of the participant and country of birth of mother and father had to be known in order to be able to draw the sample.
The sample had to be drawn approximately one month before the data collection in the municipality. After receiving the sample from the municipality, the RIVM (department EMI) was completing the sample, which took about one week, by collecting the following data of the participant: sex, date of birth, initials, use of maiden name or husband family name, whole name, family name, prefix, maiden name, prefix, street, house number, postal code (four numbers and two letters), town, country of birth, country of birth father, country of birth mother.
The sample was completed approximately two weeks before the data collection in the municipality but not much sooner because of possible changes in the accuracy of the sample through deaths or relocation of the invitees.

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