

**Supplementary Table 1. Distribution of sample within 30 clusters in Tshwane Region 5**

Site	Cluster	Houses	Accessible houses	Nobody home		No child aged 12-23 months	Aged 12-23 months; no RtHC	Aged 12-23 months; RtHC		
		provided by CoT		Houses visited	or entry refused			Eligible	No consent	Successful
Onverwacht	1	428	336	336	6	312	2	16	1	15
Refilwe	2*	446	490	490	25	433	5	27	1	26
	3	502	310	310	22	267	3	18	2	16
	4	510	395	395	32	347	4	12	0	12
	5*	497	497†	369	75	259	7	28	2	26
	6	492	355	355	45	283	0	27	2	25
	7	482	306	306	6	282	1	17	2	15
	8	460	298	298	23	252	6	17	2	15
	9	489	337	337	5	316	5	11	1	10
	10	467	394	394	17	346	3	28	4	24
	11	428	221	221	17	188	3	13	1	12
	12	456	156	156	11	135	4	6	0	6
	13‡	410	0							
	Cullinan	14	402	380	380	87	289	0	4	4
15		427	286	286	52	232	0	2	0	2
16		412	304	304	8	290	2	4	1	3
17§		386	0							
Rayton	18	453	307	307	11	289	5	2	1	1
	19	432	262	262	42	208	0	12	0	12
	20	442	148	148	19	126	1	2	2	0
	21	433	324	324	82	225	2	15	14	1
	22	424	263	263	21	239	1	2	2	0
	23§	426	0							
Kameeldrift	24	502	363	363	99	242	3	19	5	14
	25	522	450	450	109	318	5	18	1	17
	26‡	503	0							
	27‡	490	0							
	28§	506	0							
Baviaanspoort and Roodeplaat	29*	452	739	739	159	560	3	17	2	15
Derdepoort and Roodeplaat	30	514	267	267	55	200	2	10	1	9
<b>Total</b>		<b>13 793</b>	<b>8 188</b>	<b>8060</b>	<b>1028¶</b>	<b>6638</b>	<b>67  </b>	<b>327</b>	<b>51</b>	<b>276</b>

CoT = City of Tshwane; RtHC = Road to Health Card

\*Clusters with more houses than indicated on the CoT map

†More houses were accessible; stopped surveying after target was reached (N=26)

‡Clusters that could not be surveyed because they were made up of vacant or undeveloped numbered stands

§Clusters that could not be surveyed because they were made up of gated communities or security complexes

¶Entry was refused at 245 houses, despite someone being at home

||48 left at the crèche; 11 left at home as family was on vacation; 8 lost

**Supplementary Table 2. Frequencies of vaccination combinations and drop-out rates (N=276 children)**

<b>Interval</b>	<b>Vaccine combinations</b>	<b>Frequency, n (%)</b>	<b>% Drop-out*</b>
Birth	OPV0	275 (99.6)	
	OPV0+BCG	273 (98.9)	0.7
6 weeks	OPV0+BCG+RV1	272 (98.6)	0.4
	OPV0+BGC+RV1+Penta1	271 (98.2)	0.4
	OPV0+BCG+RV1+Penta1+PCV1	269 (97.5)	0.7
	OPV0+BCG+RV1+Penta1+PCV1+HepB1	267 (96.7)	0.7
	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1	262 (94.9)	1.9
10 weeks	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2	261 (94.6)	0.4
	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2	260 (94.2)	0.4
14 weeks	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2+PCV2	256 (92.8)	1.5
	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2+PCV2+RV2	254 (92.0)	0.8
	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2+PCV2+RV2+HepB3	249 (90.2)	2.0
	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2+PCV2+RV2+HepB3+Penta3	248 (89.9)	0.4
6 months	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2+PCV2+RV2+HepB3+Penta3+MV1	235 (85.1)	5.2
9 months	OPV0+BCG+RV1+Penta1+PCV1+HepB1+OPV1+Penta2+HepB2+PCV2+RV2+HepB3+Penta3+MV1+PCV3	217 (78.6)	7.7

\*The drop-out rate was calculated using the number of children who received the previous vaccine series in the schedule as the denominator. It is the percentage of children who received the previous vaccination combination, who did not receive the next vaccination in the series.

OPV = oral poliovirus vaccine; BCG = Bacille Calmette-Guérin vaccine; RV = rotavirus vaccine; Penta = pentavalent vaccine (diphtheria, tetanus, acellular pertussis, inactivated poliovirus, *Haemophilus influenzae* type b); PCV = pneumococcal conjugate vaccine; HepB = hepatitis B vaccine; MV = measles vaccine.

**Supplementary Table 3. Frequency distribution of reasons for missed vaccinations (N=59 children; 123 vaccinations)**

Age	Vaccine	Facility obstacles			Lack of information			Personal obstacles			Lack of motivation		Total
		Vaccine out of stock	Demotivated after stock-outs	Time of clinic hours inconvenient	Unaware child is not immunised	Unaware of the need for another dose	Clinic location unknown	Caregiver too busy	Child with grandparents	Forgot RtHC <sup>†</sup> ; claims child is immunised	Lost faith in health system	No faith in vaccination	
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
<b>At birth</b>	<b>BCG</b>	1 (50.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	<b>2</b>
	<b>OPV 0</b>	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	<b>1</b>
<b>6 weeks</b>	<b>OPV 1</b>	0 (0.0)	0 (0.0)	0 (0.0)	7 (87.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (12.5)	<b>8</b>
	<b>RV 1</b>	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	<b>2</b>
	<b>HepB1</b>	2 (50.0)	0 (0.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	<b>4</b>
	<b>Penta1</b>	1 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	<b>2</b>
	<b>PCV 1</b>	1 (33.3)	0 (0.0)	0 (0.0)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (33.3)	<b>3</b>
<b>10 weeks</b>	<b>HepB2</b>	2 (50.0)	0 (0.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	<b>4</b>
	<b>Penta2</b>	2 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (33.3)	<b>3</b>
<b>14 weeks</b>	<b>RV 2</b>	0 (0.0)	1 (12.5)	1 (12.5)	1 (12.5)	0 (0.0)	1 (12.5)	1 (12.5)	0 (0.0)	1 (12.5)	1 (12.5)	1 (12.5)	<b>8</b>
	<b>HepB3</b>	4 (36.4)	1 (9.1)	1 (9.1)	0 (0.0)	0 (0.0)	1 (9.1)	1 (9.1)	0 (0.0)	1 (9.1)	1 (9.1)	1 (9.1)	<b>11</b>
	<b>Penta3</b>	4 (30.8)	1 (7.7)	1 (7.7)	2 (15.4)	0 (0.0)	1 (7.7)	1 (7.7)	0 (0.0)	1 (7.7)	1 (7.7)	1 (7.7)	<b>13</b>
	<b>PCV 2</b>	0 (0.0)	1 (14.3)	1 (14.3)	1 (14.3)	0 (0.0)	1 (14.3)	1 (14.3)	0 (0.0)	0 (0.0)	1 (14.3)	1 (14.3)	<b>7</b>
<b>6 months</b>	<b>MCV 1</b>	2 (10.0)	1 (5.0)	5 (25.0)	1 (5.0)	0 (0.0)	0 (0.0)	7 (35.0)	1 (5.0)	1 (5.0)	1 (5.0)	1 (5.0)	<b>20</b>
<b>9 months</b>	<b>PCV 3</b>	1 (2.9)	1 (2.9)	7 (20.0)	0 (0.0)	11 (31.4)	0 (0.0)	12 (34.3)	1 (2.9)	0 (0.0)	1 (2.9)	1 (2.9)	<b>35</b>
<b>Total</b>		<b>20 (16.3)</b>	<b>6 (4.9)</b>	<b>16 (13.0)</b>	<b>18 (14.6)</b>	<b>11 (8.9)</b>	<b>4 (3.3)</b>	<b>23 (18.7)</b>	<b>2 (1.6)</b>	<b>4 (3.3)</b>	<b>6 (4.9)</b>	<b>13 (10.6)</b>	<b>123</b>
<b>Children affected*</b>		<b>11 (16.7)</b>	<b>1 (1.5)</b>	<b>8 (12.1)</b>	<b>15 (22.7)</b>	<b>11 (16.7)</b>	<b>1 (1.5)</b>	<b>14 (21.2)</b>	<b>1 (1.5)</b>	<b>2 (3.0)</b>	<b>1 (1.5)</b>	<b>1 (1.5)</b>	<b>66</b>

\*Children affected total 59; 7 children had missed vaccinations because of 2 different reasons, thus the total is 66; <sup>†</sup>RtHC = Road to Health Card