Early infant diagnosis of HIV infection in South Africa: 2008 to 2010

Gayle Sherman[a,b*], Rivka Lilian[b]

[a]National Health Laboratory Service and Department of Molecular Medicine and Haematology, University of the Witwatersrand
[b]Paediatric HIV Diagnostic Syndicate, Wits Health Consortium
*Corresponding author at: gayle.sherman@nhls.ac.za

Report prepared: 1 March 2011

The assistance of Sue Candy, her team managing the NHLS Data Warehouse and Dr Peter Barron (Technical Advisor to DDG strategic health programmes NDOH) is acknowledged.

This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID) and PEPFAR.

BACKGROUND:

The HIV DNA PCR test is performed for the early diagnosis of HIV infection in HIV-exposed children aged less than 18-months of age[1]. HIV antibody detection assays, used to diagnose HIV infection in adults cannot be used early in life because of the persistence of maternal HIV antibodies acquired by passive immunisation. The South African Prevention of Mother-to-Child Transmission (PMTCT) guidelines recommend that all HIV-exposed infants receive a DNA PCR test at 6-weeks of age and 6 weeks after cessation of breastfeeding. In practice, not all HIV-exposed infants access a PCR test and many access the test much later than 6-weeks of age, most commonly when they present with symptoms of HIV infection. The rate of PCR testing after cessation of breastfeeding is unknown.

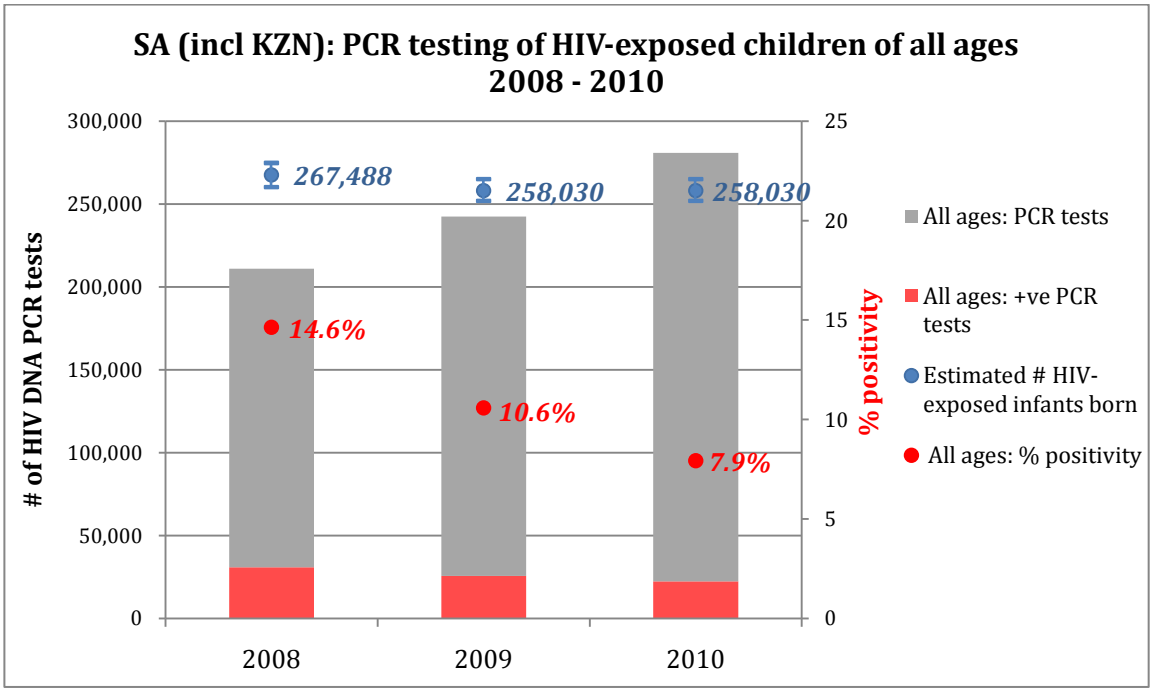
PCR data presented below was extracted from the Data Warehouse of the National Health Laboratory Services (NHLS) and represents numbers of tests performed as opposed to number of patients tested. Therefore an infant that tests positive at 6-weeks of age may present ill at 6 months of age and receive another PCR test which will be counted as two positive tests and not a single HIV-infected patient. Since there is no system of unique identifiers to accurately link multiple tests to a single patient, the number of positive PCR tests does not equate to the number of positive infants. However, PCR tests performed in infants aged 2 months and younger, closely reflect number of infants tested since it is unlikely that repeat PCR testing would have been performed in the first 2 months of life.

The percentage positivity of PCR tests performed in these young infants is an excellent proxy for *early vertical transmission rates* in those infants that access an early diagnosis.

The estimated number of HIV-exposed infants in South Africa (with 95% confidence intervals) for 2008 and 2009 were calculated by multiplying **recorded live births** reported in the Stats SA Statistical Release P0305 [2, 3] by the **antenatal maternal HIV prevalence rates** and 95% confidence intervals reported in the annual National Antenatal Sentinel HIV and Syphilis Prevalence Survey [4]. Since no figures for live births and maternal prevalence for 2010 are currently available, the estimates for 2010 are the same as for 2009.

The number of PCR tests performed in infants aged 2 months and less, which closely approximates the number of infants tested, in comparison to the estimated numbers of HIV-exposed infants serves as a proxy of the *coverage of early infant diagnosis*.

HIV PCR TESTING PERFORMED NATIONALLY 2008-2010:



	Estimated # HIV-exposed infants born	All ages: Total tests	All ages: Positive tests	All ages: % positivity
2008	267 488 (260 184 - 274 791)	210 959	30 879	14.6%
2009	258 030 (251 886 - 265 051)	242 499	25 664	10.6%
2010	258 030 (251 886 - 265 051)	280 899	22 282	7.9%

The total number of PCR tests performed nationally increased from 210 959 in 2008 to 280 899 in 2010 with a corresponding decline in number of positive PCR tests from 30 879 to 22 282. This represents a decline in positive PCR results from 14.6% in 2008 to 7.9% in 2010 in the HIV-exposed infants tested. This decline in percentage positivity is likely to reflect

1. *reduced vertical transmission* as a result of PMTCT interventions and
2. *increased accessibility of PCR testing* to **all** HIV-exposed infants (more likely to test PCR negative) in comparison to earlier testing patterns where predominantly symptomatic HIV-exposed infants (likely to be PCR positive) accessed testing

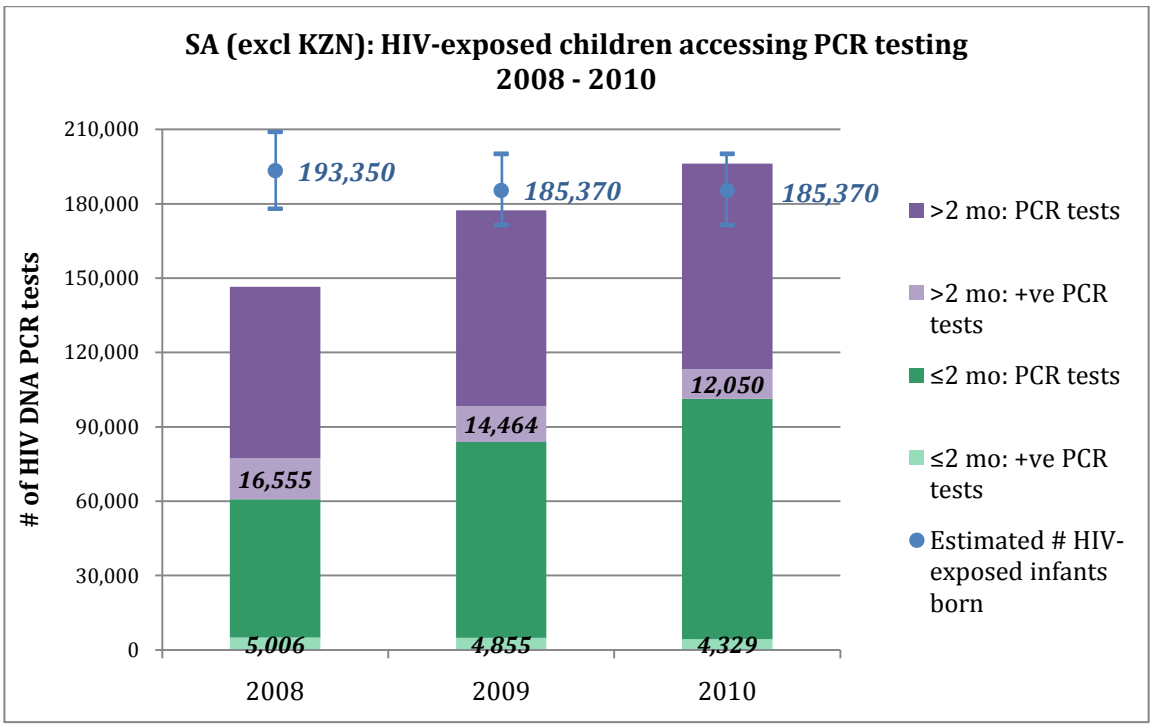
The total number of PCR tests performed in 2010 exceeded the estimated total number of HIV-exposed infants. This is likely due to repeat testing of infants (e.g. after cessation of breastfeeding or if an HIV-exposed infant presents with symptoms suggestive of HIV infection) and for reasons of poor communication (e.g. no handheld patient records to identify that a PCR test has previously been performed and poor access to laboratory results to search for previous PCR test results).

The set of data that follows excludes PCR testing performed in the province of KwaZulu Natal because until June 2010, this was the only province in the country

using a different laboratory information system to store test data and accurate disaggregated data is not available.

The estimated number of HIV-exposed infants in KZN ranged from 73 812 to 72 336 in 2008 to 2010. The total number of PCR tests performed in KZN and excluded from further analysis range from 64 445 in 2008 to 84 645 in 2010 and account for about 30% of all PCR tests performed during the three year period.

HIV PCR TESTING PERFORMED NATIONALLY (EXCLUDING KWAZULU NATAL) 2008 – 2010:



	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	193 350 (178 031 - 209 024)	146 514	85 755	60 759	5 006	8.2%	31.4%
2009	185 370 (171 407 - 200 144)	177 329	93 494	83 835	4 855	5.8%	45.2%
2010	185 370 (171 407 - 200 144)	196 254	94 935	101 319	4 329	4.3%	54.7%

In the remaining 8 provinces, total PCR tests performed increased from 146 514 in 2008 to 196 254 in 2010 and total percentage positivity decreased from 14.7% to 10.9% to 8.3% in 2008, 2009 and 2010 respectively. These percentages are marginally higher than before KZN data was excluded but demonstrate the same downward trend.

The number of HIV-exposed infants tested early (viz. at 2-months of age or less) increased from 60 759 in 2008 to 101 319 in 2010 whilst the percentage of

positive tests decreased from 8.2% to 4.3% suggesting a *declining vertical transmission rate in the first 2 months* of life attributable to improved PMTCT coverage and regimens, notably the replacement of single dose Nevirapine with dual therapy (sdNVP and AZT from 28 weeks) during 2008.

Despite an increase of 1.7 times in the number of PCR tests being performed in this younger age, the number of HIV-infected infants decreased from 5006 to 4329 between 2008 and 2010. In an environment of improving PMTCT, higher PCR testing rates yield lower numbers of HIV-infected infants making it theoretically easier for programs to concentrate on ensuring HIV-infected infants access care.

In 2008 an estimated ±193 000 HIV-exposed infants required a PCR test at 6-weeks of age and 60 759 PCR tests were performed in infants aged 2 months and younger yielding *coverage of early diagnosis* of 31.4%. By 2010, 101 319 PCR tests were performed in infants aged 2 months and younger on the estimated 185 370 HIV-exposed infants amounting to approximately 54.7% of the target population receiving an early diagnosis.

In addition to the total number of PCR tests being performed in younger infants (aged 2-months and less) increasing from 60 759 in 2008 to 101 319 in 2010, the percentage of total tests being performed earlier in life increased from 42% to 52% suggesting increased PCR testing earlier in life.

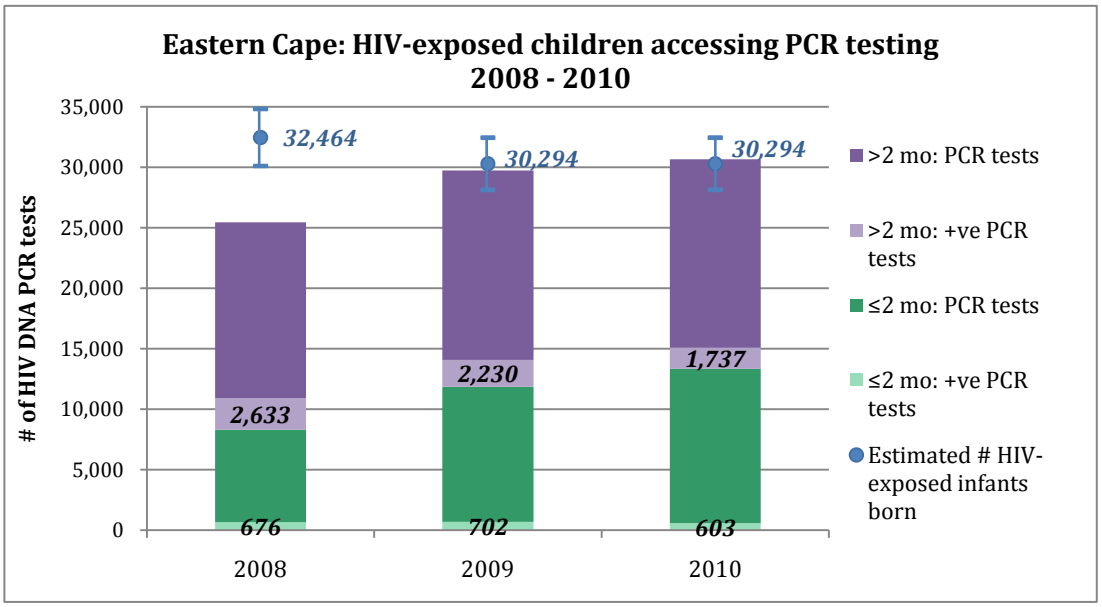
In infants and children aged more than 2 months of age, the percentage positivity decreased from 19.3% to 15.5% to 12.7 % from 2008 to 2010 respectively yielding proportionally less PCR positive results over time with 16 555 in 2008 and 12 050 in 2010. How these positive PCR tests equate to numbers of HIV-infected children is difficult to say since many may represent duplicate tests on the same children. Nevertheless, these positive PCR tests are likely to represent a large number of children whose HIV is diagnosed late most likely because they present symptomatic and/or did not access PMTCT care. The coverage of post breastfeeding PCR testing is unknown and many of the infants tested after 2-months of age may have postnatal transmission from breastmilk.

In this older group of infants and children the percentage tested in age groups >2-9 months, >9-18 months, >18 months and of unknown age remained fairly constant between 2008 and 2010 at ±36%, ±10%, ±5% and ±2% respectively.

PROVINCIAL PCR TESTS 2008 – 2010:

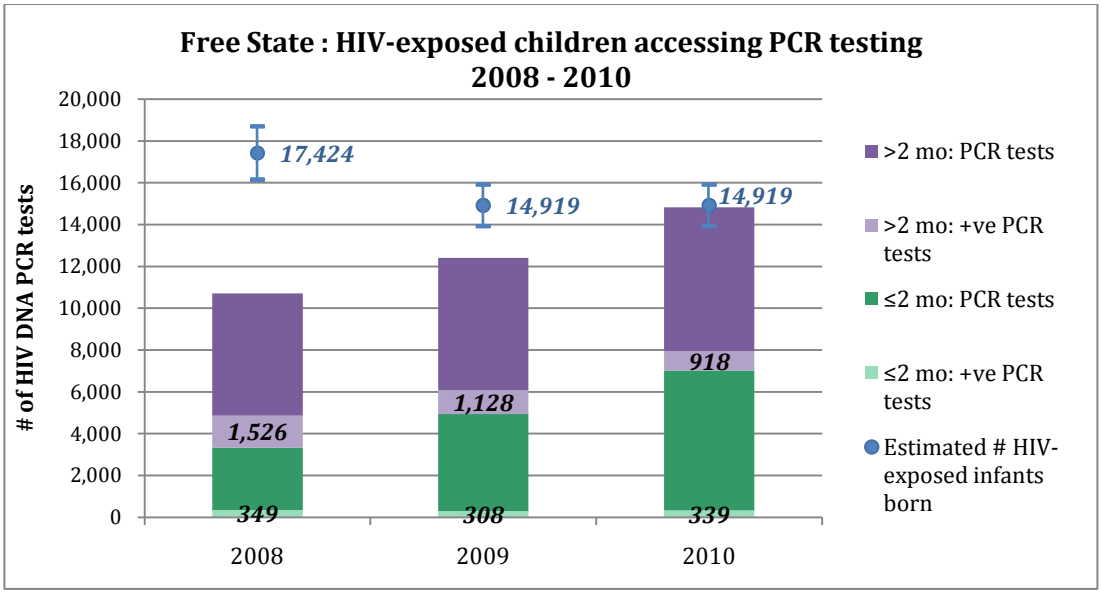
The provincial PCR data reflects the trends noted in the national data over time viz. increasing total PCR tests with increasing proportions being performed on young infants; decreasing early vertical transmission rates and numbers of HIV-infected infants and improved coverage of PCR testing.

1. EASTERN CAPE



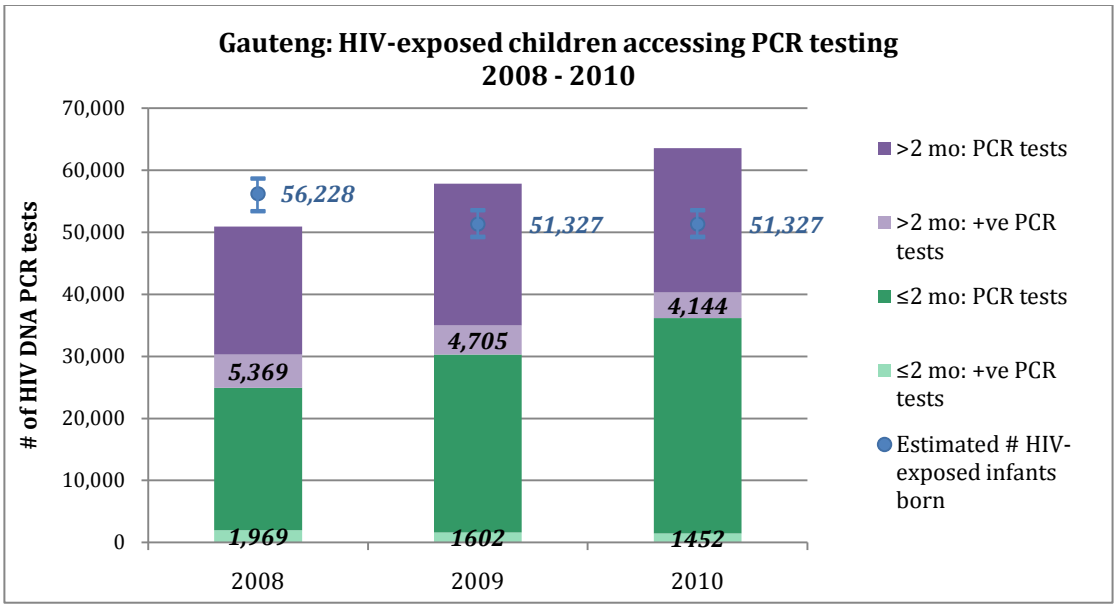
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	32 464 (30 111 - 34 816)	25 464	17 162	8 302	676	8.1%	25.6%
2009	30 294 (28 138 - 32 450)	29 741	17 895	11 846	702	5.9%	39.1%
2010	30 294 (28 138 - 32 450)	30 650	17 308	13 342	603	4.5%	44.0%

2. FREE STATE



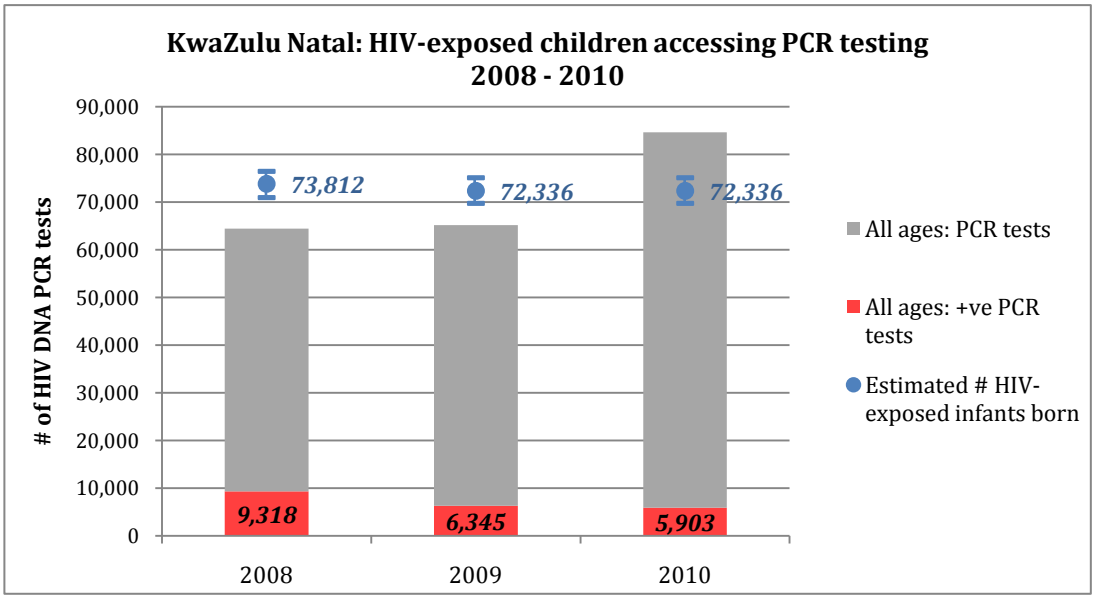
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	17 424 (16 152 - 18 695)	10 715	7 377	3 338	349	10.5%	19.2%
2009	14 919 (13 928 - 15 911)	12 413	7 474	4 939	308	6.2%	33.1%
2010	14 919 (13 928 - 15 911)	14 833	7 808	7 025	339	4.8%	47.1%

3. GAUTENG



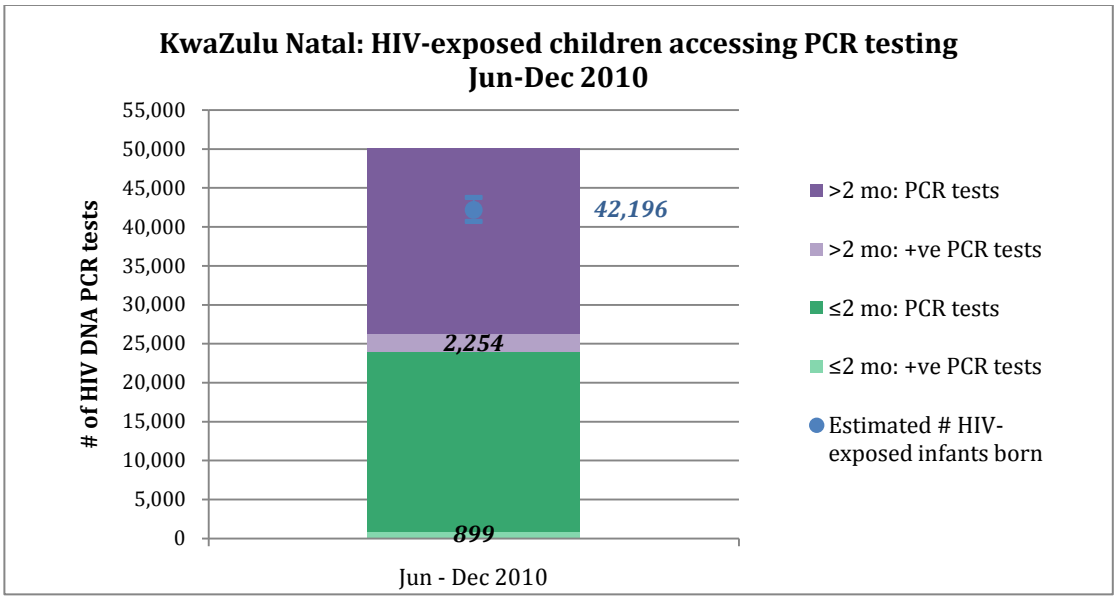
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	56 228 (53 407 - 58 673)	50 916	25 987	24 929	1 969	7.9%	44.3%
2009	51 327 (49 260 - 53 566)	57 842	27 552	30 290	1 602	5.3%	59.0%
2010	51 327 (49 260 - 53 566)	63 567	27 398	36 169	1 452	4.0%	70.5%

4a. KWAZULU NATAL



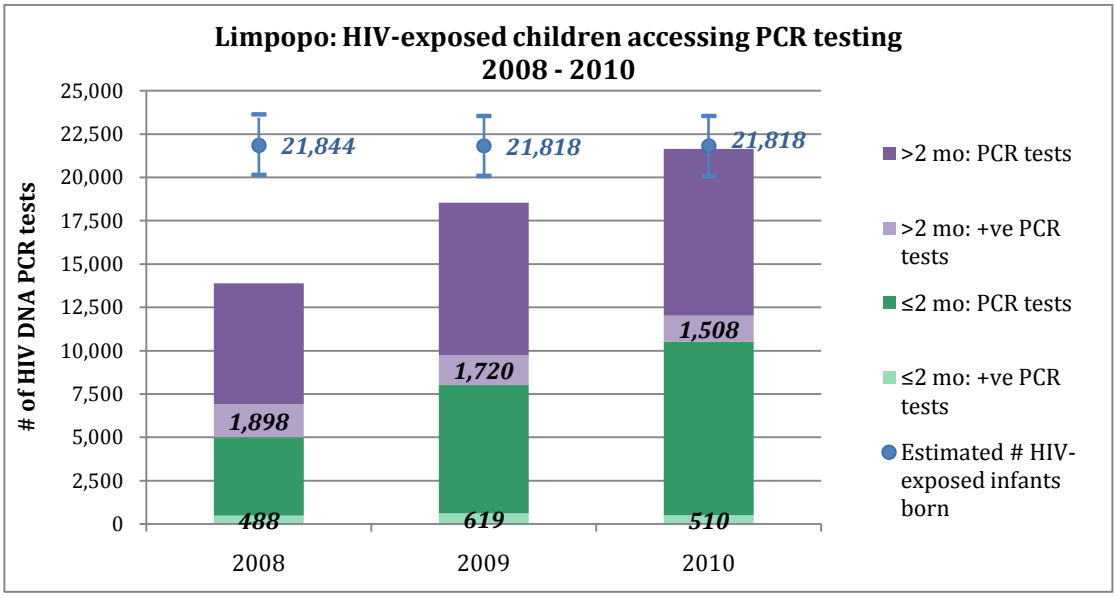
	Estimated # HIV-exposed infants born	All ages: Total tests	All ages: Positive tests
2008	73 812 (70 951 - 76 482)	64 445	9 318
2009	72 336 (69 773 - 75 083)	65 170	6 345
2010	72 336 (69 773 - 75 083)	84 645	5 903

4b. KWAZULU NATAL



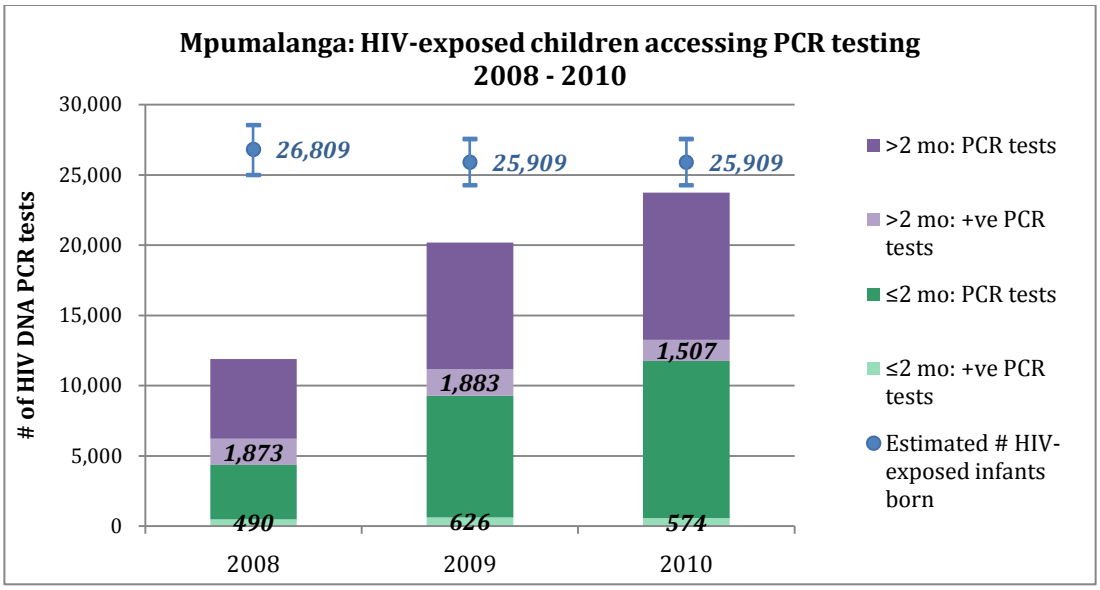
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
Jun - Dec 2010	42 196 (40 701 - 43 799)	50 106	26 098	24 008	899	3.7%	56.9%

5. LIMPOPO



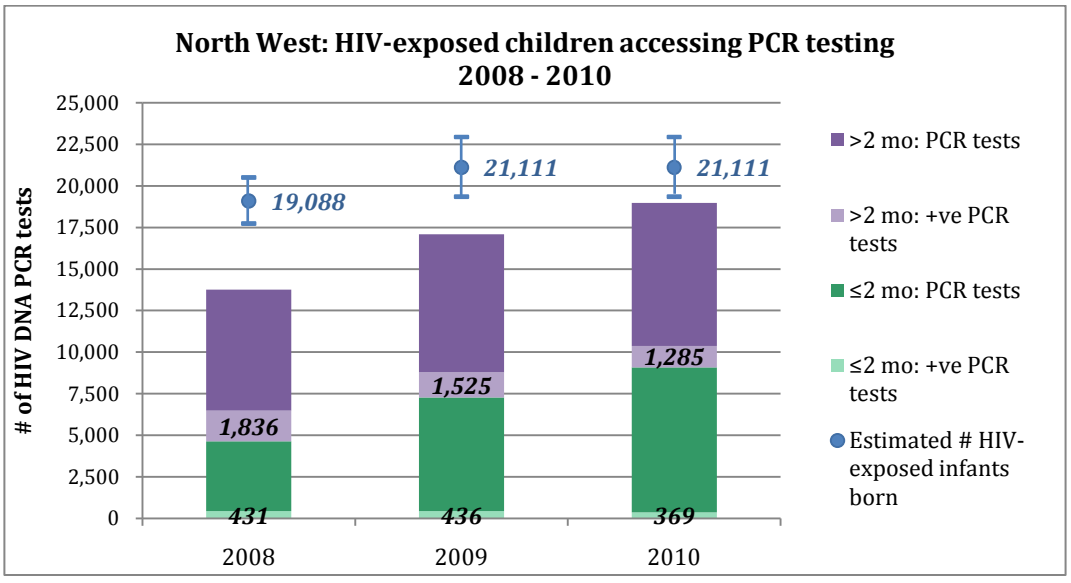
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	21 844 (20 155 - 23 638)	13 899	8 889	5 010	488	9.7%	22.9%
2009	21 818 (20 084 - 23 551)	18 551	10 539	8 012	619	7.7%	36.7%
2010	21 818 (20 084 - 23 551)	21 649	11 138	10 511	510	4.9%	48.2%

6. MPUMALANGA



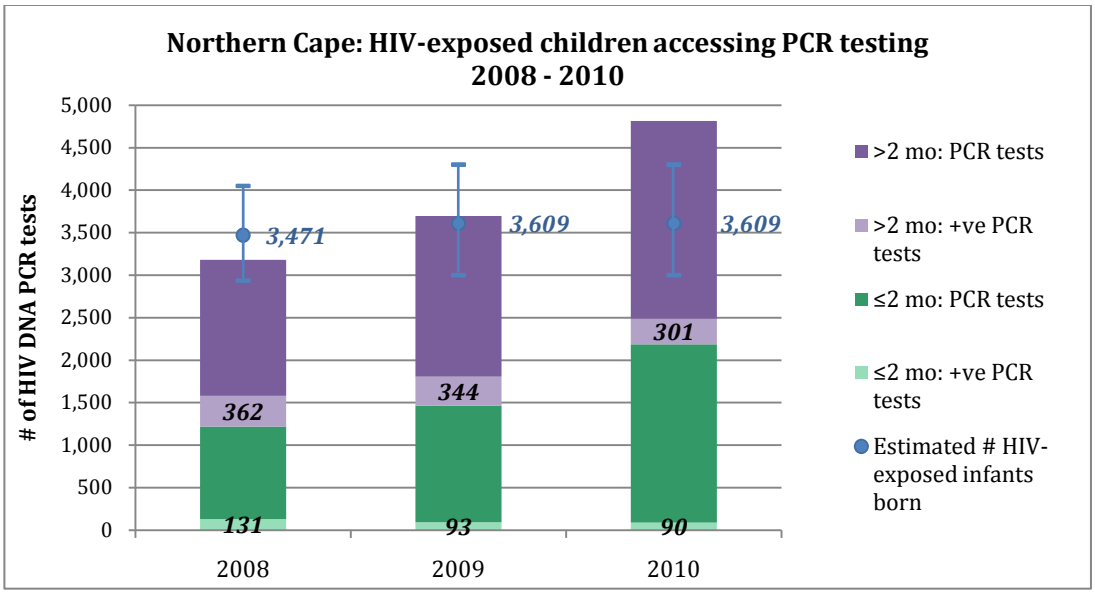
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	26 809 (24 997 - 28 546)	11 904	7 558	4 346	490	11.3%	16.2%
2009	25 909 (24 266 - 27 552)	20 192	10 912	9 280	626	6.7%	35.8%
2010	25 909 (24 266 - 27 552)	23 740	11 984	11 756	574	4.9%	45.4%

7. NORTH WEST



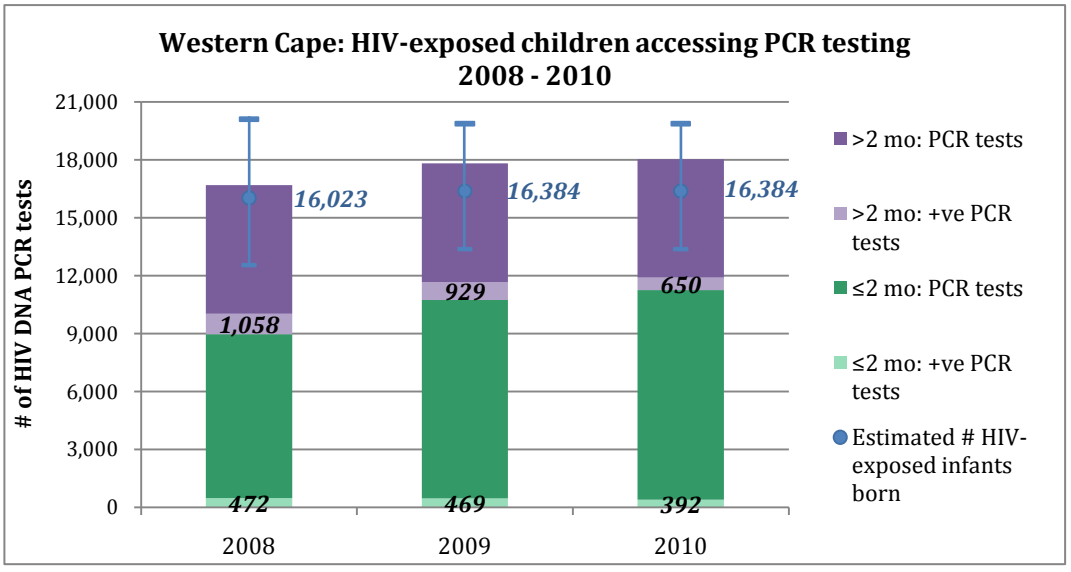
	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	19 088 (17 733 - 20 504)	13 754	9 111	4 643	431	9.3%	24.3%
2009	21 111 (19 351 - 22 940)	17 084	9 811	7 273	436	6.0%	34.5%
2010	21 111 (19 351 - 22 940)	18 976	9 893	9 083	369	4.1%	43.0%

8. NORTHERN CAPE



	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	3 471 (2 935 - 4 049)	3 181	1 963	1 218	131	10.8%	35.1%
2009	3 609 (3 000 - 4 301)	3 695	2 232	1 463	93	6.4%	40.5%
2010	3 609 (3 000 - 4 301)	4 814	2 626	2 188	90	4.1%	60.6%

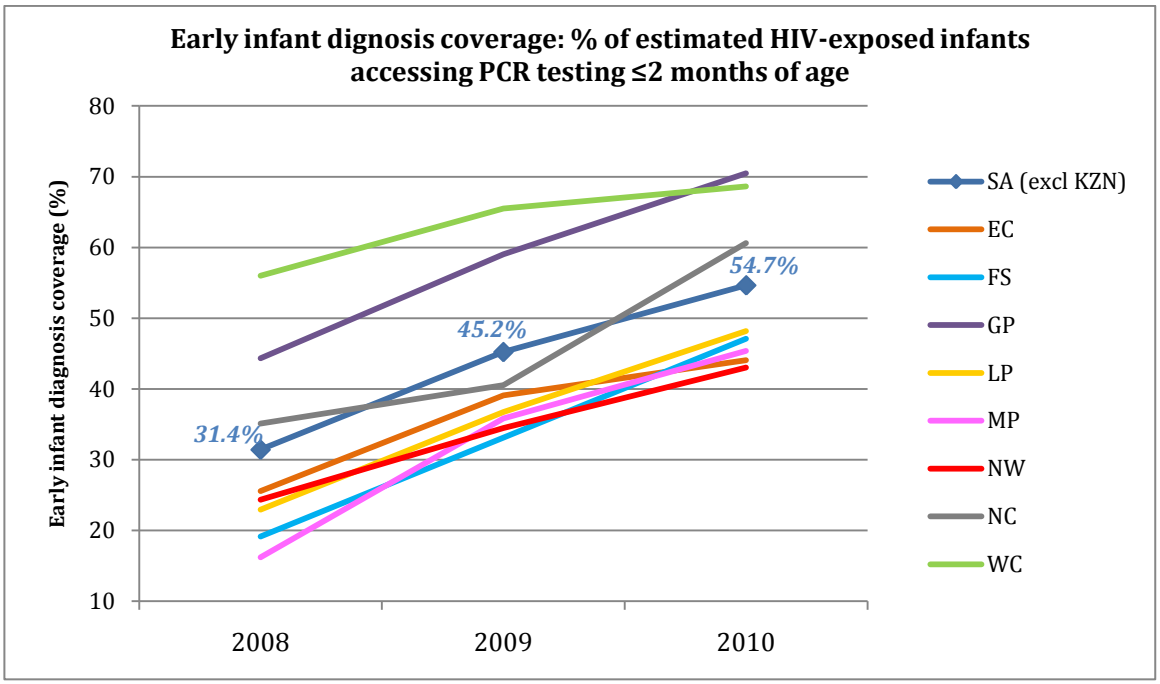
9. WESTERN CAPE



	Estimated # HIV-exposed infants born	All ages: Total tests	> 2 mo: Total tests	≤2 mo: Total tests	≤2 mo: Positive tests	≤2 mo: % positivity	EID coverage
2008	16 023 (12 540 - 20 104)	16 681	7 708	8 973	472	5.3%	56.0%
2009	16 384 (13 378 - 19 874)	17 811	7 079	10 732	469	4.4%	65.5%
2010	16 384 (13 378 - 19 874)	18 025	6 780	11 245	392	3.5%	68.6%

COMPARSION OF COVERAGE OF EARLY INFANT DIAGNOSIS BETWEEN PROVINCES

The coverage of early infant diagnosis improved in all provinces over the three year time period with Gauteng (70.5%), Western Cape (68.6%) and Northern Cape (60.6%) above the national average of 54.7% by 2010. Coverage in the other provinces ranged from 43% in North West to 48.2% in Limpopo in 2010. The coverage in KZN for the last 7 months of 2010 was 56.9%.



HIV PCR TESTING BY DISTRICT 2008 – 2010:

	2008							2009							2010						
	Estimated # of HIV-exposed infants born	PCR testing in children of all ages		PCR testing in infants ≤2 months of age				Estimated # of HIV-exposed infants born	PCR testing in children of all ages		PCR testing in infants ≤2 months of age				Estimated # of HIV-exposed infants born	PCR testing in children of all ages		PCR testing in infants ≤2 months of age			
		Total tests	Pos tests	Total tests	% of exposed infants accessing early testing	Pos tests	% Positivity		Total tests	Pos tests	Total tests	% of exposed infants accessing early testing	Pos tests	% Positivity		Total tests	Pos tests	Total tests	% of exposed infants accessing early testing	Pos tests	% Positivity
South Africa (incl KZN)	**267 488**	**210 959**	**30 879**					**258 030**	**242 499**	**25 664**					**258 030**	**280 899**	**22 282**				
South Africa (excl KZN)	**193 350**	**146 514**	**21 561**	**60 759**	**31.4**	**5 006**	**8.2**	**185 370**	**177 329**	**19 319**	**83 835**	**45.2**	**4 855**	**5.8**	**185 370**	**196 254**	**16 379**	**101 319**	**54.7**	**4 329**	**4.3**
Eastern Cape	**32 464**	**25 464**	**3 309**	**8 302**	**25.6**	**676**	**8.1**	**30 294**	**29 741**	**2 932**	**11 846**	**39.1**	**702**	**5.9**	**30 294**	**30 650**	**2 340**	**13 342**	**44.0**	**603**	**4.5**
Alfred Nzo	3 189	1 809	229	471	14.8	41	8.7	2 199	2 459	279	799	36.3	60	7.5	2 199	2 379	204	899	40.9	41	4.6
Amatole	9 473	6 751	885	2 414	25.5	189	7.8	9 188	7 833	707	3 488	38.0	165	4.7	9 188	7 852	587	3 787	41.2	163	4.3
Cacadu	1 363	1 520	177	579	42.5	51	8.8	1 341	1 760	156	794	59.2	40	5.0	1 341	1 680	125	785	58.6	35	4.5
Chris Hani	3 758	3 344	357	1 104	29.4	80	7.2	3 496	3 435	296	1 462	41.8	85	5.8	3 496	3 734	208	1 751	50.1	64	3.7
Nelson Mandela Bay Metro	6 080	4 416	634	1 761	29.0	132	7.5	5 947	4 427	411	2 269	38.2	124	5.5	5 947	4 340	304	2 430	40.9	112	4.6
O.R. Tambo	7 552	6 747	932	1 744	23.1	163	9.3	6 502	8 205	913	2 419	37.2	183	7.6	6 502	8 744	773	2 832	43.6	160	5.6
Ukhahlamba	1 105	877	95	229	20.7	20	8.7	1 208	1 622	170	615	50.9	45	7.3	1 208	1 921	139	858	71.0	28	3.3
Free State	**17 424**	**10 715**	**1 875**	**3 338**	**19.2**	**349**	**10.5**	**14 919**	**12 413**	**1 436**	**4 939**	**33.1**	**308**	**6.2**	**14 919**	**14 833**	**1 257**	**7 025**	**47.1**	**339**	**4.8**
Fezile Dabi	2 638	1 732	313	500	19.0	58	11.6	2 009	2 097	258	939	46.7	59	6.3	2 009	2 471	199	1 257	62.6	61	4.9
Lejweleputswa	3 717	2 284	423	672	18.1	62	9.2	3 432	3 163	364	1 242	36.2	79	6.4	3 432	3 566	336	1 843	53.7	112	6.1
Motheo	5 407	3 985	726	1 357	25.1	148	10.9	4 618	3 426	445	1 322	28.6	83	6.3	4 618	4 167	371	1 655	35.8	74	4.5
Thabo Mofutsanyane	5 209	2 280	359	700	13.4	73	10.4	4 464	3 073	323	1 214	27.2	78	6.4	4 464	4 057	322	1 945	43.6	82	4.2
Xhariep	395	434	54	109	27.6	8	7.3	312	654	46	222	71.1	9	4.1	312	572	29	325	104.1	10	3.1
Gauteng	**56 228**	**50 916**	**7 338**	**24 929**	**44.3**	**1 969**	**7.9**	**51 327**	**57 842**	**6 307**	**30 290**	**59.0**	**1 602**	**5.3**	**51 327**	**63 567**	**5 596**	**36 169**	**70.5**	**1 452**	**4.0**
City of Johannesburg	18 976	20 735	2 519	12 211	64.3	856	7.0	17 090	21 966	2 087	13 097	76.6	610	4.7	17 090	24 311	2 003	15 180	88.8	592	3.9
City of Tshwane	10 798	10 172	1 657	4 261	39.5	409	9.6	7 734	11 759	1 395	5 443	70.4	321	5.9	7 734	12 232	1 165	6 397	82.7	251	3.9
Ekurhuleni	14 930	11 951	1 948	5 218	34.9	462	8.9	15 426	14 741	1 792	7 269	47.1	430	5.9	15 426	17 067	1 634	9 379	60.8	400	4.3
Metsweding	1 410	382	43	125	8.9	10	8.0	1 917	793	66	369	19.3	20	5.4	1 917	823	45	490	25.6	20	4.1
Sedibeng	6 596	3 705	542	1 380	20.9	99	7.2	6 072	3 914	409	1 701	28.0	80	4.7	6 072	3 897	313	1 789	29.5	60	3.4
West Rand	3 256	3 971	629	1 734	53.2	133	7.7	3 333	4 669	558	2 411	72.3	141	5.8	3 333	5 237	436	2 934	88.0	129	4.4
KwaZulu-Natal	**73 812**	**64 445**	**9 318**					**72 336**	**65 170**	**6 345**					**72 336**	**84 645**	**5 903**				
															42 196	**50 106**	**3 153**	**24 008**	**56.9**	**899**	**3.7**
Amajuba	3 204							3 792							2 212	2 340	101	1 330	60.1	36	2.7
eThekwini	25 413							24 724							14 422	14 946	1 029	7 382	51.2	302	4.1
iLembe	3 578							4 145							2 418	3 225	190	1 656	68.5	54	3.3
Sisonke	2 119							2 107							1 229	1 695	124	695	56.5	27	3.9
Ugu	7 410							7 017							4 093	4 113	225	1 966	48.0	69	3.5
UMgungundlovu	7 422							6 602							3 851	4 543	280	2 465	64.0	76	3.1
Umkhanyakude	4 480							4 349							2 537	4 123	274	2 005	79.0	85	4.2
Umzinyathi	2 318							1 712							999	2 639	136	1 238	124.0	38	3.1
Uthukela	4 595							4 572							2 667	3 194	190	1 202	45.1	45	3.7
Uthungulu	7 507							8 649							5 045	4 341	283	1 985	39.3	78	3.9
Zululand	6 023							5 800							3 383	4 947	321	2 084	61.6	89	4.3

'% of exposed infants accessing early testing': Red text = Districts with percentage coverage that is 2% or less than the provincial average.
Purple text = Districts with percentage coverage that is 10% or more than the provincial average.
Coverage values that are greater than 100% may reflect under-estimation of number of HIV-exposed infants.

KwaZulu Natal figures in the red box are for June to December 2010.

	2008							2009							2010						
	Estimated # of HIV-exposed infants born	PCR testing in children of all ages		PCR testing in infants ≤2 months of age				Estimated # of HIV-exposed infants born	PCR testing in children of all ages		PCR testing in infants ≤2 months of age				Estimated # of HIV-exposed infants born	PCR testing in children of all ages		PCR testing in infants ≤2 months of age			
		Total tests	Pos tests	Total tests	% of exposed infants accessing early testing	Pos tests	% Positivity		Total tests	Pos tests	Total tests	% of exposed infants accessing early testing	Pos tests	% Positivity		Total tests	Pos tests	Total tests	% of exposed infants accessing early testing	Pos tests	% Positivity
Limpopo	**21 844**	**13 899**	**2 386**	**5 010**	**22.9**	**488**	**9.7**	**21 818**	**18 551**	**2 339**	**8 012**	**36.7**	**619**	**7.7**	**21 818**	**21 649**	**2 018**	**10 511**	**48.2**	**510**	**4.9**
Capricorn	5 918	2 969	505	1 090	18.4	103	9.4	6 489	4 634	575	2 151	33.1	157	7.3	6 489	5 210	466	2 718	41.9	133	4.9
Mopani	4 304	3 120	558	1 074	25.0	114	10.6	4 430	4 268	480	1 773	40.0	132	7.4	4 430	4 837	475	2 230	50.3	109	4.9
Sekhukhune	2 937	2 939	420	1 123	38.2	89	7.9	2 207	3 230	425	1 440	65.3	127	8.8	2 207	3 531	328	1 836	83.2	86	4.7
Vhembe	4 799	2 860	492	1 007	21.0	92	9.1	4 390	3 382	481	1 275	29.0	104	8.2	4 390	4 205	413	1 882	42.9	90	4.8
Waterberg	3 339	2 011	411	716	21.4	90	12.6	3 970	3 037	378	1 373	34.6	99	7.2	3 970	3 866	336	1 845	46.5	92	5.0
Mpumalanga	**26 809**	**11 904**	**2 363**	**4 346**	**16.2**	**490**	**11.3**	**25 909**	**20 192**	**2 509**	**9 280**	**35.8**	**626**	**6.7**	**25 909**	**23 740**	**2 081**	**11 756**	**45.4**	**574**	**4.9**
Ehlanzeni	13 393	5 984	1 225	2 238	16.7	276	12.3	12 657	9 512	1 323	4 488	35.5	330	7.4	12 657	11 514	1 099	5 981	47.3	312	5.2
Gert Sibande	6 088	2 740	506	956	15.7	84	8.8	5 820	5 033	574	2 240	38.5	150	6.7	5 820	6 188	494	2 960	50.9	137	4.6
Nkangala	7 032	3 180	632	1 152	16.4	130	11.3	7 166	5 647	612	2 552	35.6	146	5.7	7 166	6 038	488	2 815	39.3	125	4.4
North West	**19 088**	**13 754**	**2 267**	**4 643**	**24.3**	**431**	**9.3**	**21 111**	**17 084**	**1 961**	**7 273**	**34.5**	**436**	**6.0**	**21 111**	**18 976**	**1 654**	**9 083**	**43.0**	**369**	**4.1**
Bojanala	6 882	4 077	804	1 327	19.3	147	11.1	10 931	6 100	772	2 716	24.8	165	6.1	10 931	7 264	610	3 734	34.2	148	4.0
Dr Kenneth Kaunda	5 388	3 456	530	1 274	23.6	123	9.7	4 334	3 956	405	1 701	39.2	77	4.5	4 334	3 956	359	2 038	47.0	88	4.3
Dr Ruth Segomotsi Mompati	4 434	1 958	289	703	15.9	59	8.4	3 958	2 266	254	923	23.3	72	7.8	3 958	2 697	241	1 185	29.9	47	4.0
Ngaka Modiri Molema/Central	2 494	4 263	644	1 339	53.7	102	7.6	2 210	4 762	530	1 933	87.5	122	6.3	2 210	5 059	444	2 126	96.2	86	4.0
Northern Cape	**3 471**	**3 181**	**493**	**1 218**	**35.1**	**131**	**10.8**	**3 609**	**3 695**	**437**	**1 463**	**40.5**	**93**	**6.4**	**3 609**	**4 814**	**391**	**2 188**	**60.6**	**90**	**4.1**
Frances Baard	1 805	1 693	238	741	41.1	83	11.2	2 061	1 948	200	891	43.2	58	6.5	2 061	2 723	181	1 463	71.0	51	3.5
Kgalagadi/J. T. Gaetsewe	943	541	107	149	15.8	12	8.1	774	678	106	196	25.3	10	5.1	774	915	96	331	42.7	23	6.9
Namakwa	33	103	9	23	70.4	2	8.7	0	140	18	48	-	5	10.4	0	132	14	33	-	2	6.1
Pixley ka Seme	302	512	81	167	55.4	13	7.8	274	495	51	161	58.8	10	6.2	274	561	45	178	65.0	6	3.4
Siyanda	566	332	58	138	24.4	21	15.2	551	434	62	167	30.3	10	6.0	551	483	55	183	33.2	8	4.4
Western Cape	**16 023**	**16 681**	**1 530**	**8 973**	**56.0**	**472**	**5.3**	**16 384**	**17 811**	**1 398**	**10 732**	**65.5**	**469**	**4.4**	**16 384**	**18 025**	**1 042**	**11 245**	**68.6**	**392**	**3.5**
Cape Winelands	1 480	1 897	187	992	67.0	49	4.9	1 597	2 017	155	1 223	76.6	49	4.0	1 597	2 187	127	1 331	83.3	55	4.1
Central Karoo	176	310	41	100	56.8	11	11.0	132	419	24	166	125.5	6	3.6	132	472	33	232	175.4	8	3.4
City of Cape Town	12 277	11 933	1 109	6 419	52.3	342	5.3	12 048	12 661	1 015	7 629	63.3	338	4.4	12 048	12 620	730	7 964	66.1	267	3.4
Eden	1 232	1 457	120	849	68.9	38	4.5	1 652	1 504	132	956	57.9	47	4.9	1 652	1 443	89	924	55.9	35	3.8
Overberg	411	587	34	335	81.6	15	4.5	493	657	40	419	85.1	18	4.3	493	673	34	425	86.3	14	3.3
West Coast	498	497	39	278	55.9	17	6.1	508	553	32	339	66.7	11	3.2	508	630	29	369	72.6	13	3.5

'% of exposed infants accessing early testing': Red text = Districts with percentage coverage that is 2% or less than the provincial average.
Purple text = Districts with percentage coverage that is 10% or more than the provincial average.
Coverage values that are greater than 100% may reflect under-estimation of number of HIV-exposed infants.

RECOMMENDATIONS:

Improvements in PMTCT coverage have resulted in increased numbers of PCR tests being performed every year. A continuation of this trend is likely and strategies to reduce the need for unnecessary PCR tests should be examined. Possibilities include:

- Reduce repeat testing by
    - Improving tracking of previous HIV PCR test results e.g. implementing the new Road to Health booklet that contains a laboratory tracking number to trace previous PCR results; improve the ability of clinicians to access patient HIV PCR results using the internet (www.disa)
    - Using HIV Rapid Tests from 6-months of age to exclude HIV infection and only submit for PCR testing if the rapid test is positive. Preliminary data suggests a reduction in PCR tests required by >50% at 6-8 months of age and >90% by 8-10 months of age (depending on the rapid test used) due to seroreversion.

- Ensure HIV-infected infants and children access care immediately after testing PCR positive by improving tracking of PCR positive infants and children into care.
    - Consideration should be given to using the National Health Laboratory information system to automatically extract and distribute collated PCR results on a weekly basis to specific program co-ordinators for cascading to facilities.

Ongoing training of staff on early diagnosis of HIV is essential to ensure that infants identified for PCR testing have an adequate sample submitted to avoid repeat sampling, that processes to ensure infants receive their PCR results are in place, that PCR results are correctly interpreted and the correct management plan followed.

REFERENCES:

1. National Department of Health. *Clinical Guidelines: PMTCT (Prevention of Mother-to-Child Transmission)*. 2010 [cited 1 March 2011]; Available from: http://www.hiv911.org.za/wp-content/uploads/2010/04/2010-PMTCT-Guidelines.pdf.
2. Statistics South Africa. *Statistical Release P0305: Recorded Live Births 2008*. 2009 [cited 1 March 2011]; Available from: http://www.statssa.gov.za/publications/P0305/P03052008.pdf.
3. Statistics South Africa. *Statistical Release P0305: Recorded Live Births 2009*. 2010 [cited 1 March 2011]; Available from: http://www.statssa.gov.za/publications/P0305/P03052009.pdf.

4. National Department of Health. *National Antenatal Sentinel HIV and Syphilis Prevalence Survey in South Africa, 2009*. 2010 [cited 1 March 2011]; Available from: http://www.doh.gov.za/docs/reports/2010/hiv_syphillis_09.pdf.

DISCLAIMER:

The NHLS PCR data is linked via an NHLS location code to a particular facility/district/province. This is a dynamic link requiring regular updating and although correct in the vast majority of cases, the reader should be aware that the figures reported here can change slightly as the linkages are updated.