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Estimation of Fertility in Colombia through an adjustment for coverage of births with immunization records

December 2019



International Union for the Scientific Study of Population
Union internationale pour l'étude scientifique de la population

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1

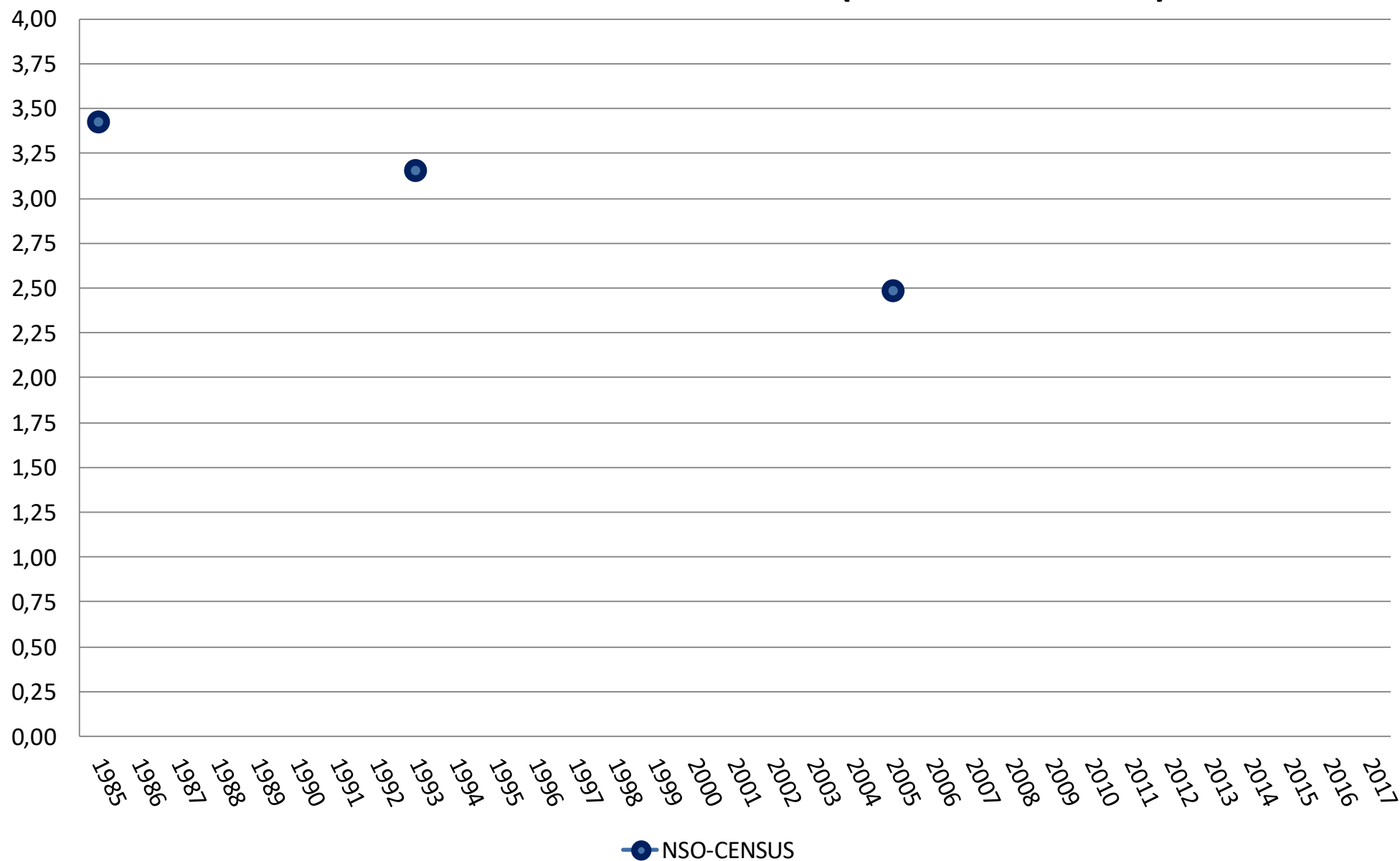
Background

We need...

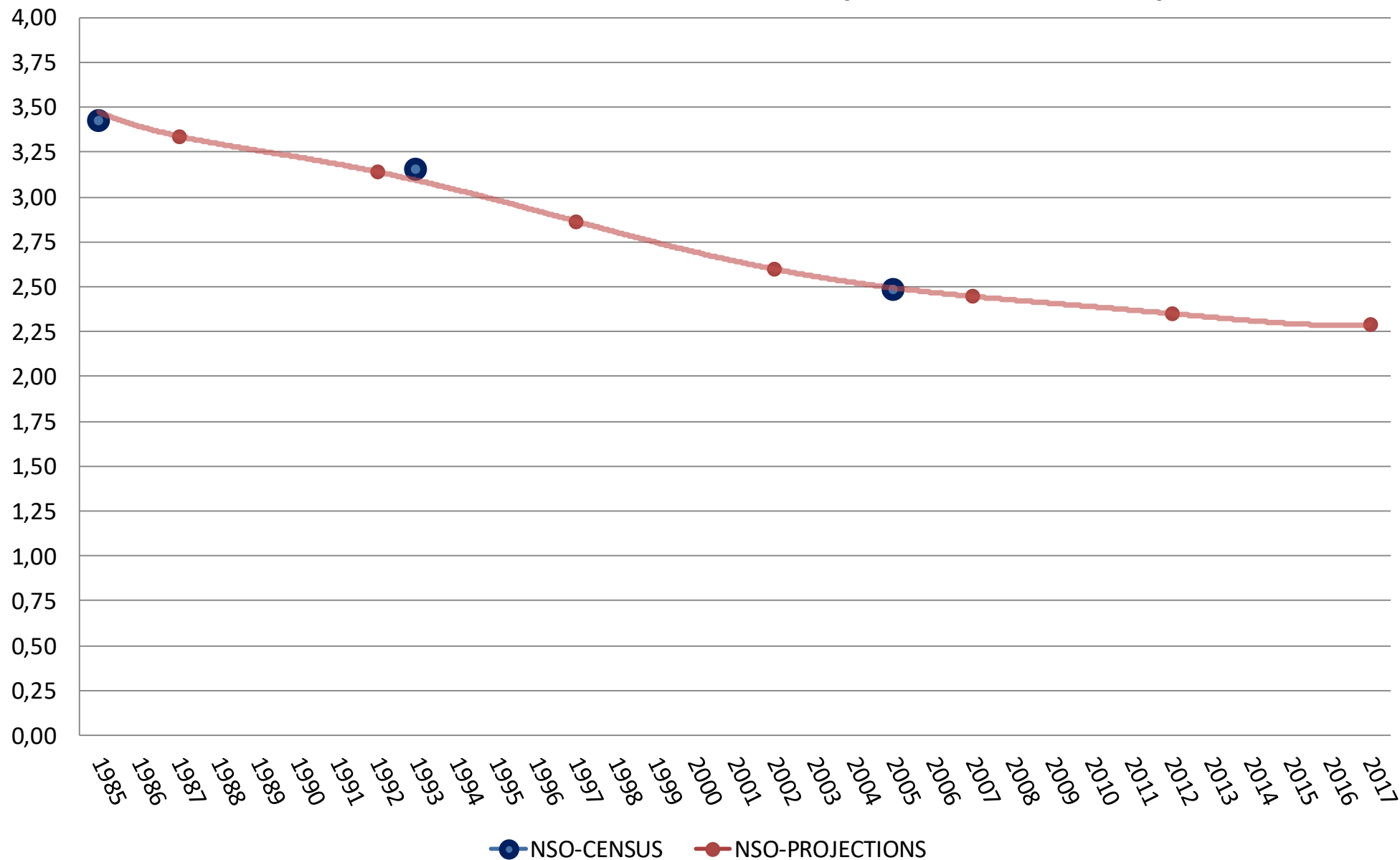
Build information systems to guide the formulation of public policy and protect the survival of vulnerable ethnic communities (Wayuú people)



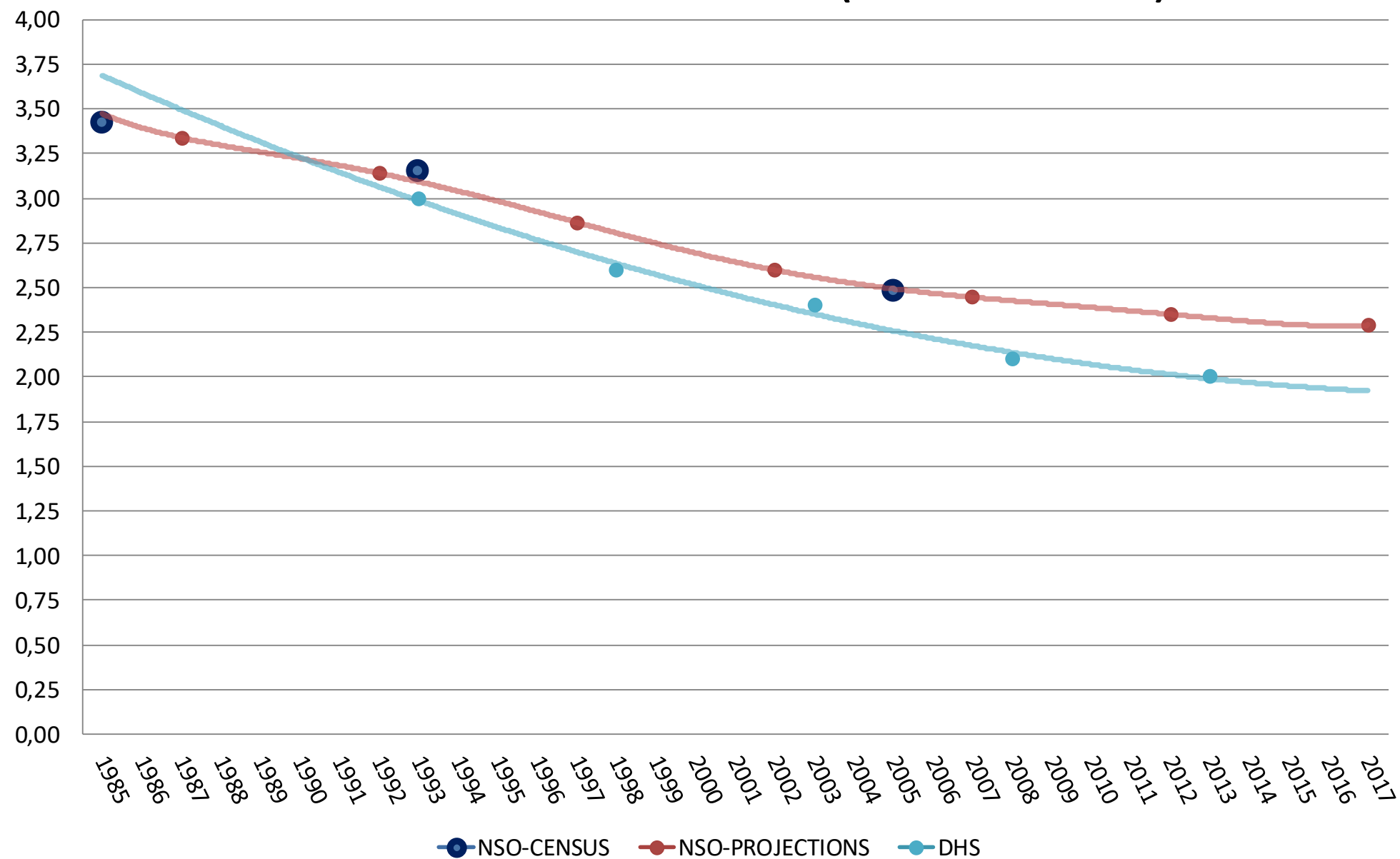
COLLECTION OF TFR - COLOMBIA (NATIONAL LEVEL)



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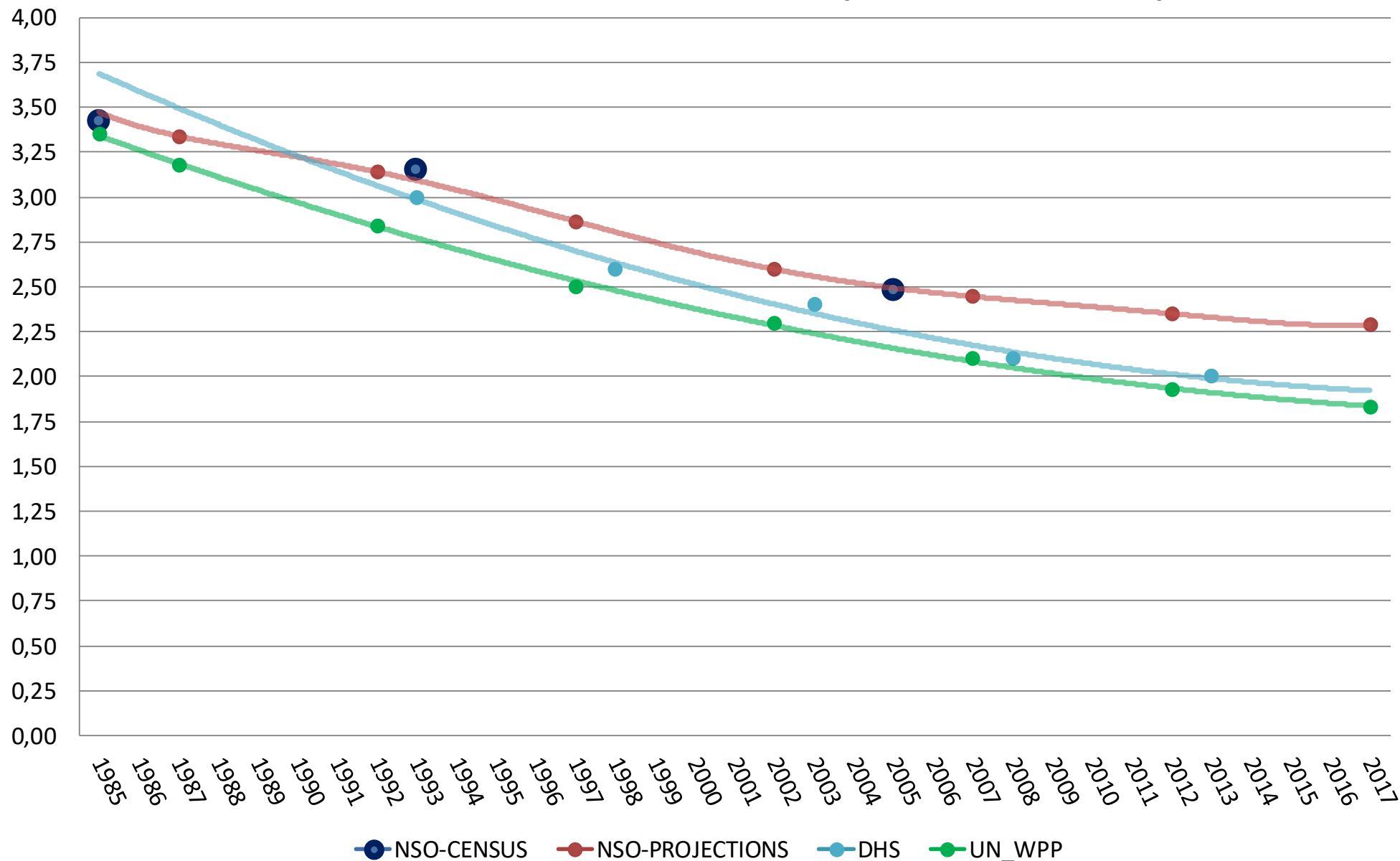


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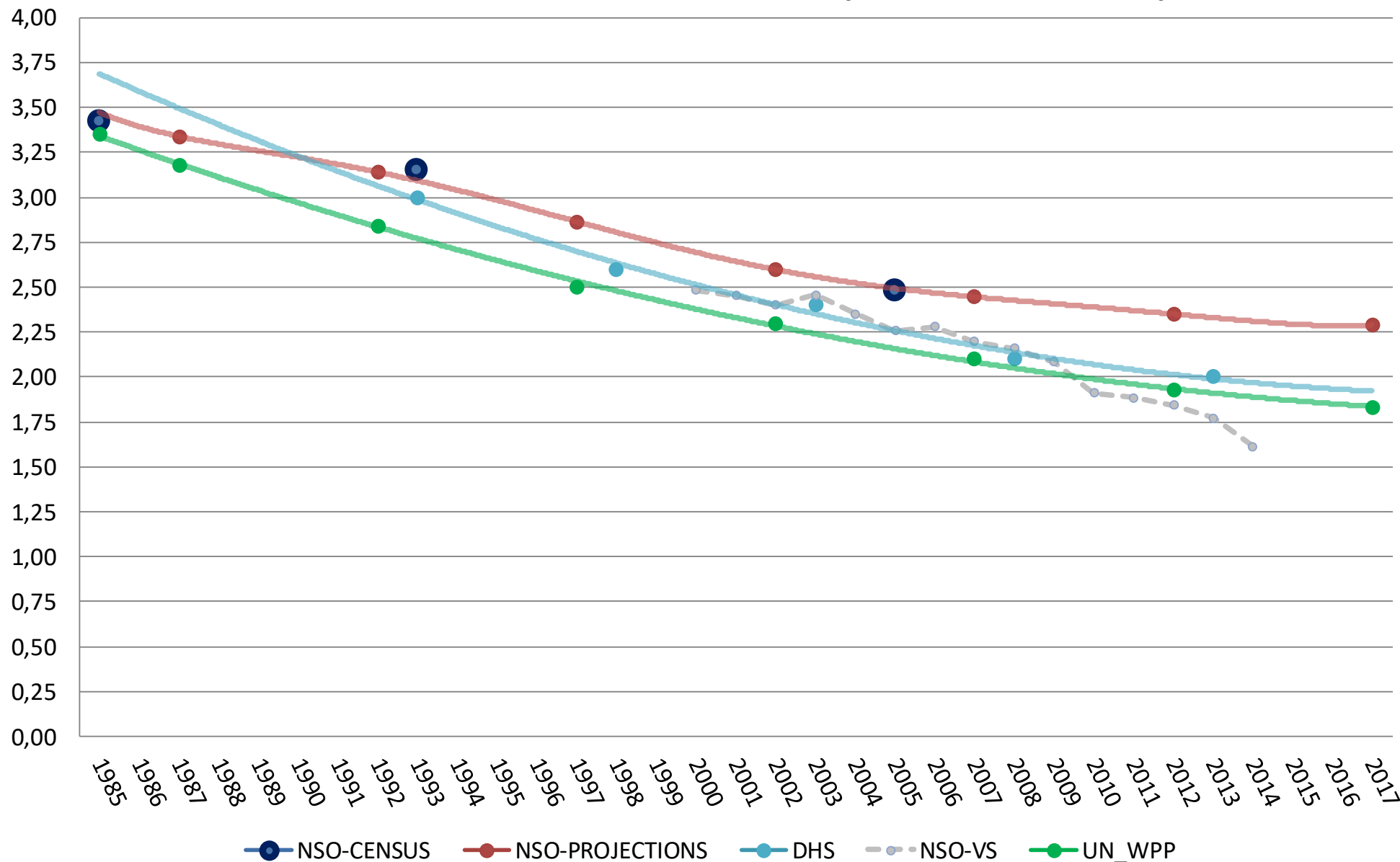
 Source: NSO, UNSD, DHS. own calculations

COLLECTION OF TFR - COLOMBIA (NATIONAL LEVEL)



 Source: NSO, UNSD, DHS. own calculations

COLLECTION OF TFR - COLOMBIA (NATIONAL LEVEL)



Source: NSO, UNSD, DHS. own calculations

2

Methodology





Expanded Program on Immunization (EPI)

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The EPI is a program that is in charge in the country of the elimination, eradication and control of the immunopreventable diseases, with the objective of diminishing the mortality and morbidity rates.



Institution in charge



MINSALUD

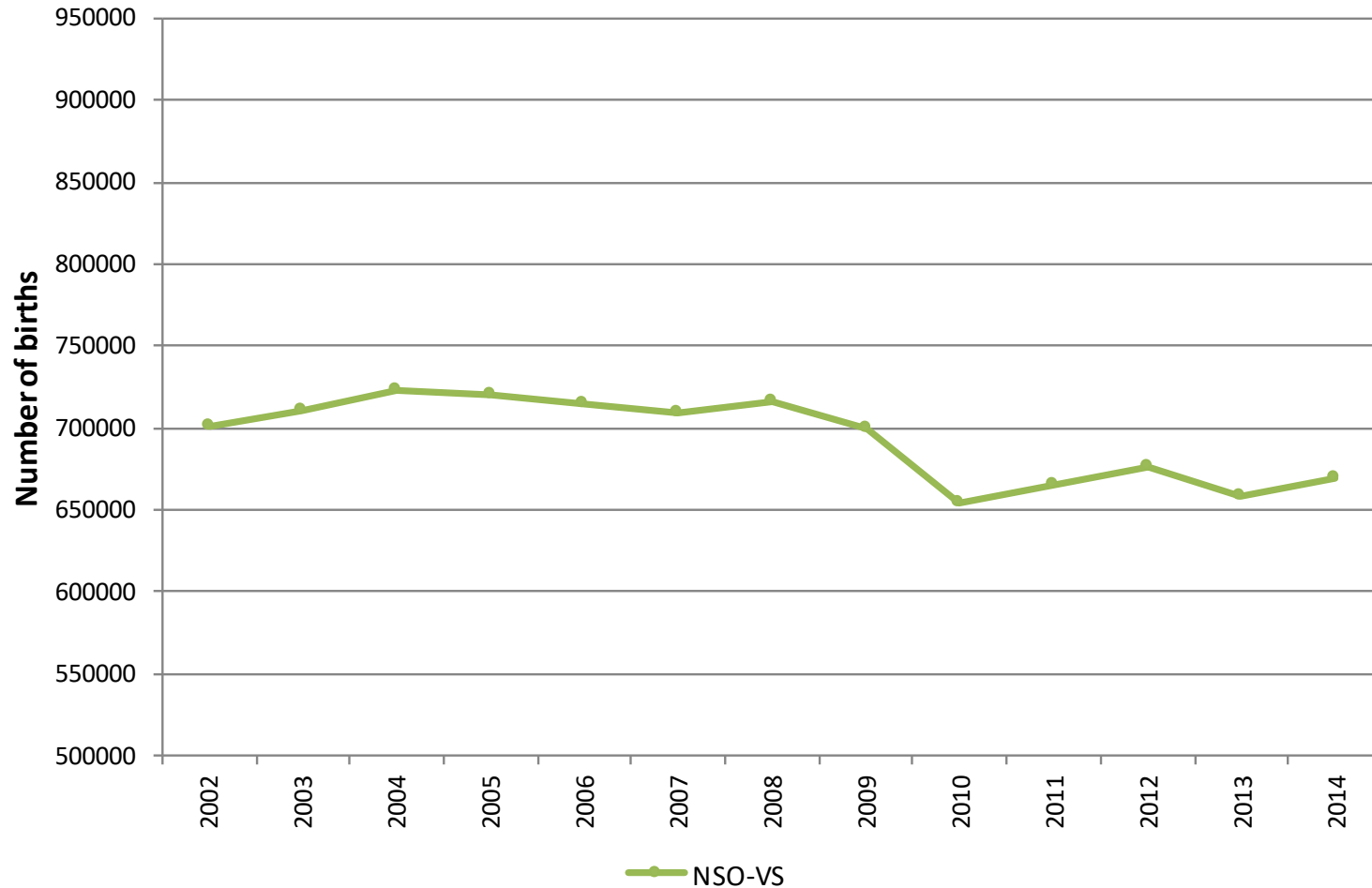


Timeline





Analysis of national total coverage

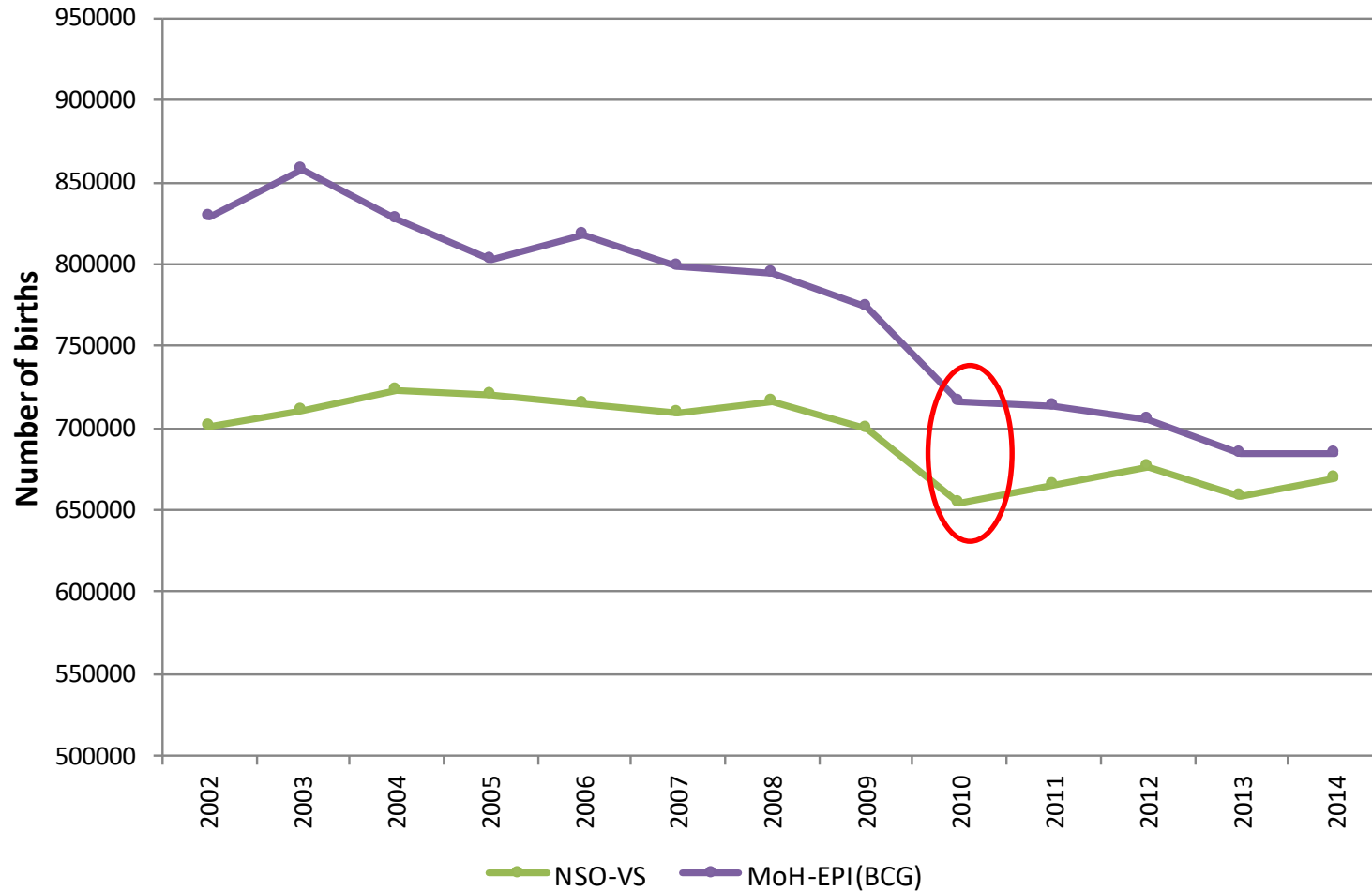


Adjustments in level and tendency to the Vital Statistics series

Representation of trend and level adjustment applied to births of the VS from the vaccination register from 2002 to 2014 at the national level.



Analysis of national total coverage

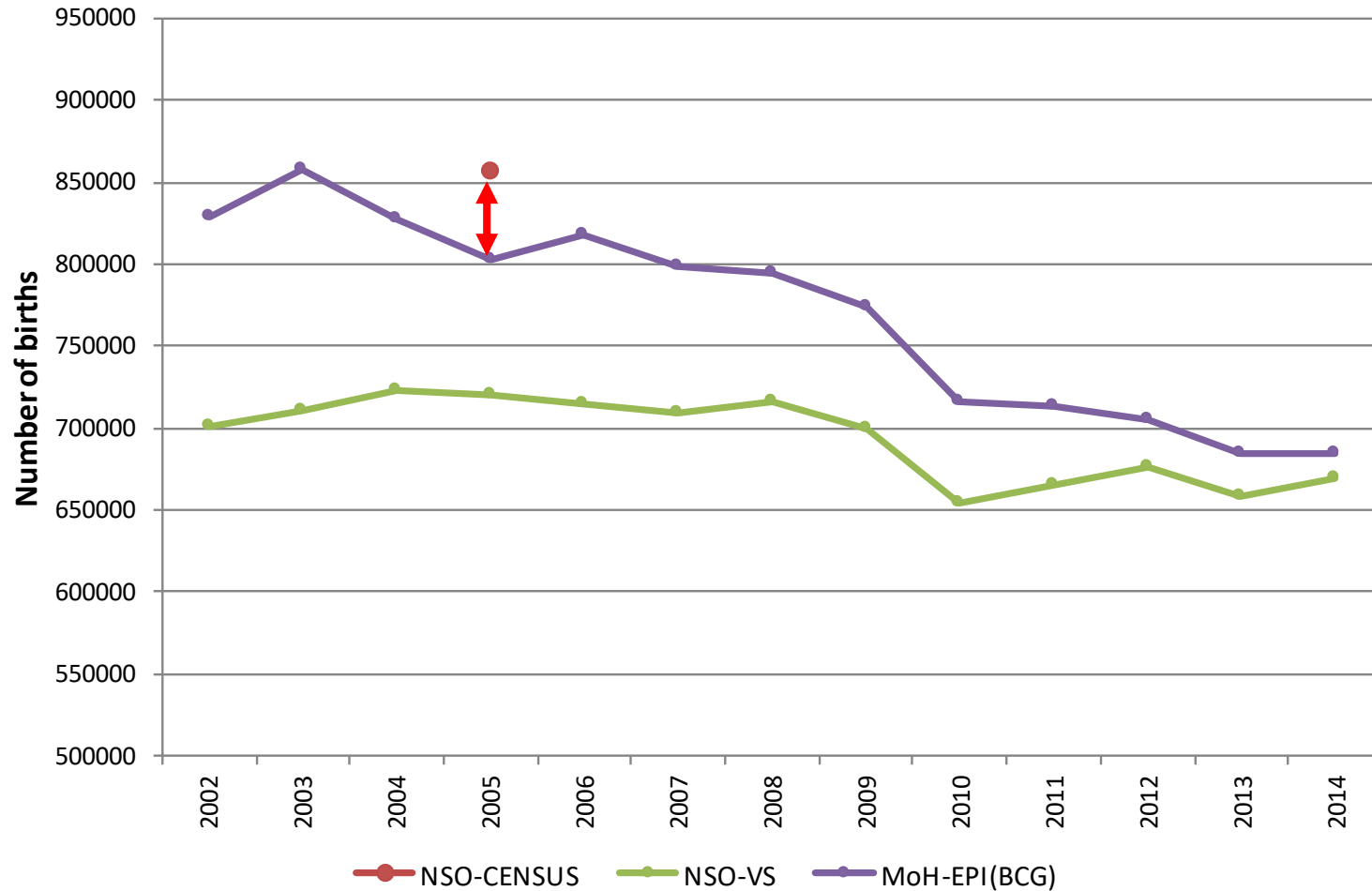


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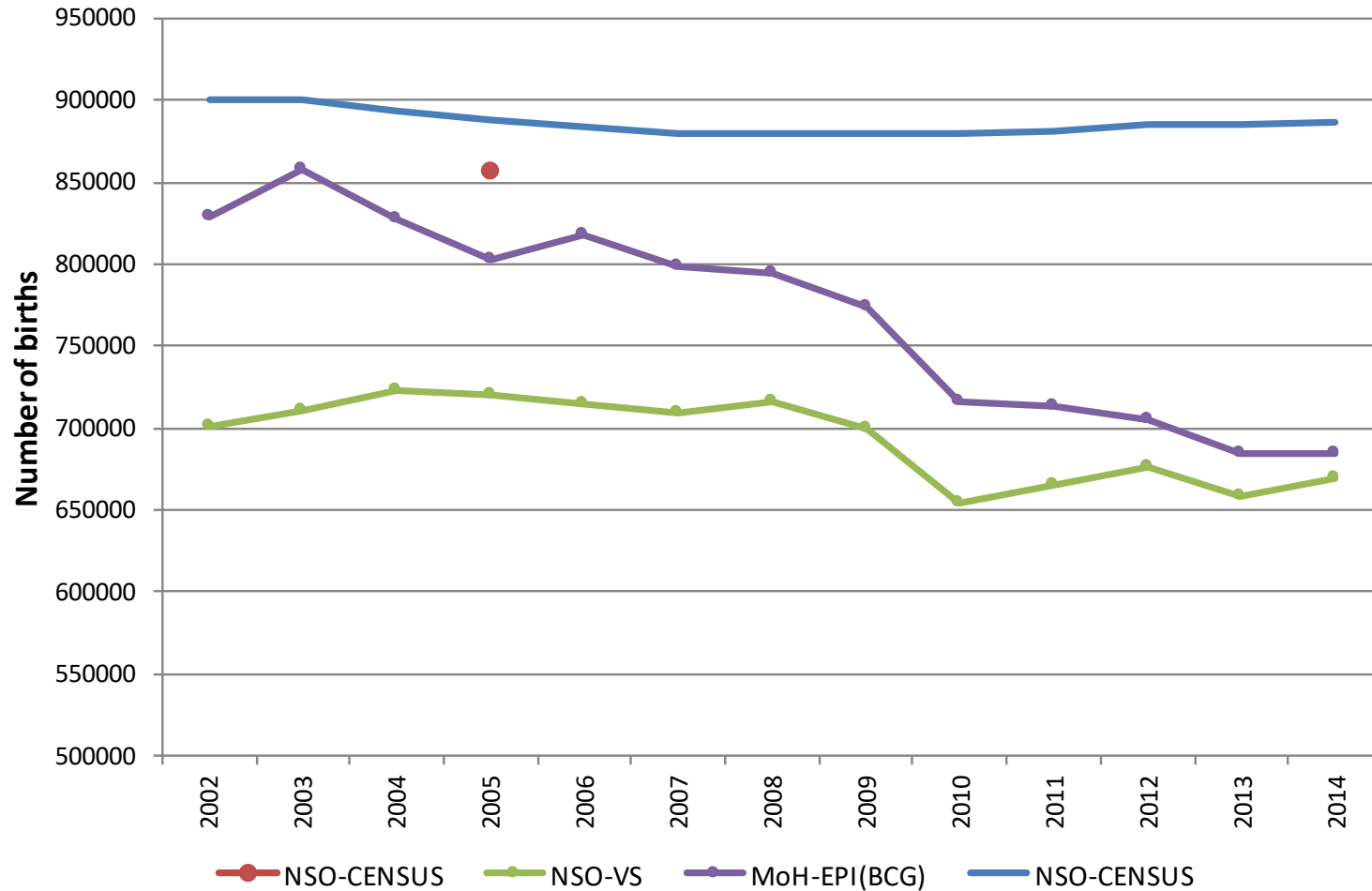


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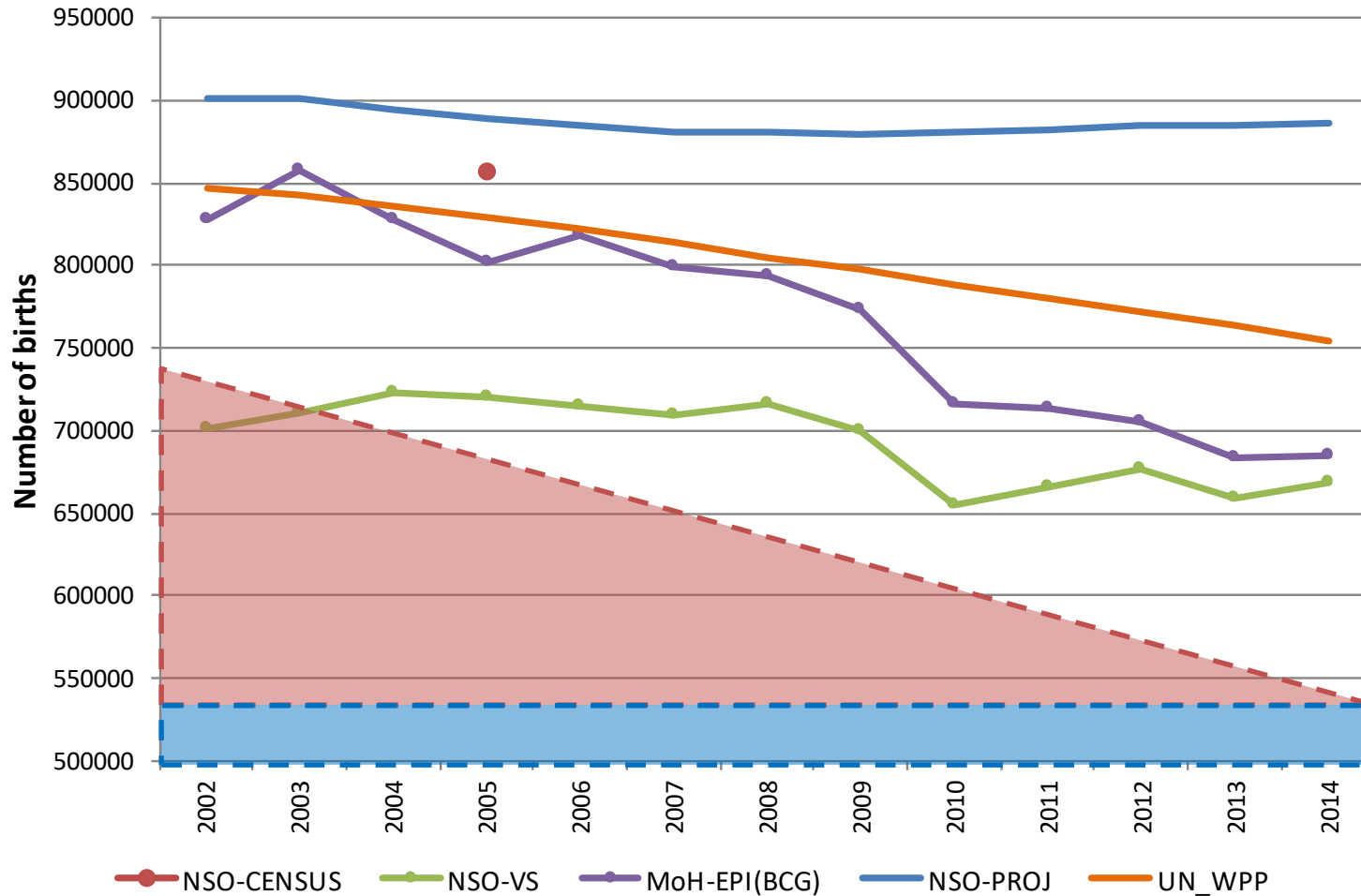


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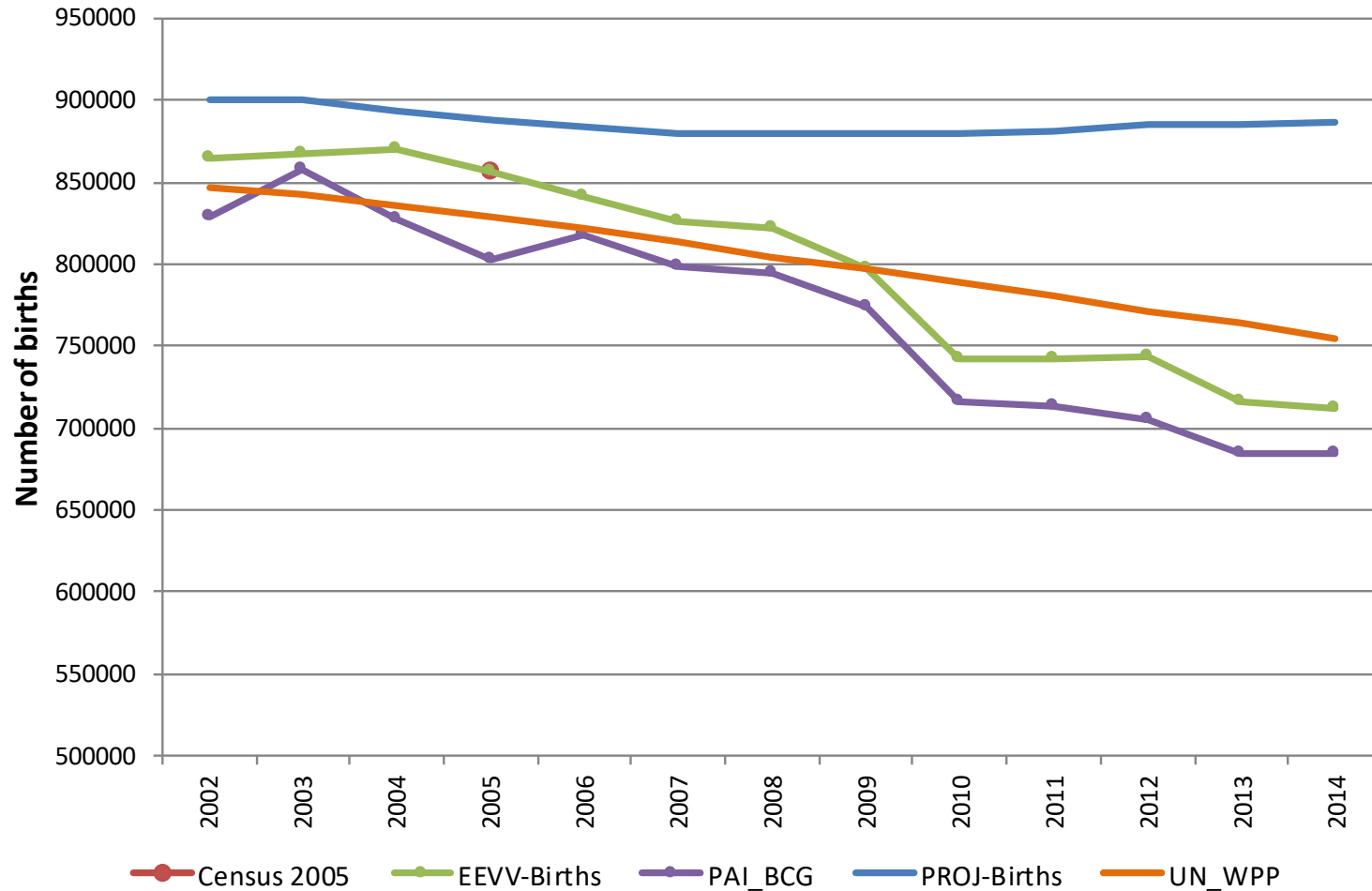


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Adjustments in level and tendency to the Vital Statistics series

Representation of trend and level adjustment applied to births of the VS from the vaccination register from 2002 to 2014 at the national level.

| LOCAL LEVELS | Relative difference (VS/EPI) | | | | | Absolute difference (EPI-VS) | | | | | % distribution undercoverage | |
|--------------------|---------------------------------|------|------|------|------|---------------------------------|--------|--------|--------|--------|---------------------------------|------|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2010 | 2011 | 2012 | 2013 | 2014 | 2013 | 2014 |
| NACIONAL | 91% | 93% | 96% | 96% | 97% | 61.657 | 47.638 | 28.434 | 25.202 | 20.683 | | |
| AMAZONAS | 78% | 81% | 87% | 83% | 89% | 369 | 328 | 241 | 296 | 192 | 1% | 1% |
| ANTIOQUIA | 99% | 99% | 95% | 99% | 100% | 724 | 919 | 4.058 | 740 | 100 | 2% | 0% |
| ARAUCA | 107% | 132% | 102% | 101% | 97% | -304 | -1.082 | -67 | -44 | 117 | 0% | 0% |
| ATLANTICO | 100% | 101% | 105% | 98% | 99% | -72 | -345 | -1.866 | 772 | 351 | 2% | 1% |
| BOLIVAR | 82% | 91% | 94% | 94% | 95% | 6.804 | 3.457 | 2.203 | 2.303 | 1.877 | 7% | 7% |
| BOYACA | 98% | 102% | 97% | 99% | 99% | 369 | -324 | 474 | 230 | 146 | 1% | 1% |
| CALDAS | 101% | 107% | 103% | 102% | 102% | -160 | -673 | -270 | -245 | -205 | 0% | 0% |
| CAQUETA | 76% | 76% | 89% | 75% | 92% | 2.309 | 2.369 | 1.007 | 2.607 | 658 | 8% | 2% |
| CASANARE | 96% | 86% | 91% | 92% | 89% | 274 | 999 | 652 | 553 | 753 | 2% | 3% |
| CAUCA | 78% | 73% | 94% | 96% | 86% | 4.437 | 5.478 | 1.089 | 690 | 2.640 | 2% | 9% |
| CESAR | 81% | 82% | 79% | 90% | 95% | 4.338 | 4.648 | 5.301 | 2.405 | 1.082 | 7% | 4% |
| CHOCO | 51% | 52% | 51% | 58% | 55% | 4.921 | 5.149 | 5.353 | 4.384 | 4.825 | 13% | 17% |
| CORDOBA | 72% | 89% | 99% | 98% | 101% | 9.182 | 3.732 | 296 | 537 | -323 | 2% | 0% |
| CUNDINAMARCA | 100% | 101% | 105% | 105% | 105% | -341 | -864 | -6.456 | -5.996 | -6.408 | 0% | 0% |
| GUAINIA | 68% | 66% | 54% | 66% | 66% | 256 | 312 | 402 | 296 | 302 | 1% | 1% |
| GUAVIARE | 90% | 85% | 84% | 89% | 94% | 148 | 222 | 237 | 133 | 68 | 0% | 0% |
| HUILA | 98% | 101% | 120% | 107% | 104% | 443 | -156 | -3.628 | -1.295 | -763 | 0% | 0% |
| LA GUAJIRA | 80% | 74% | 75% | 75% | 78% | 3.071 | 4.533 | 4.469 | 4.474 | 3.915 | 14% | 14% |
| MAGDALENA | 85% | 97% | 95% | 92% | 90% | 3.771 | 765 | 1.319 | 2.072 | 2.352 | 6% | 8% |
| META | 96% | 96% | 97% | 100% | 99% | 590 | 596 | 451 | 73 | 235 | 0% | 1% |
| NARIÑO | 83% | 86% | 90% | 92% | 91% | 3.767 | 3.011 | 2.049 | 1.595 | 1.833 | 5% | 6% |
| NORTE DE SANTANDER | 93% | 91% | 98% | 96% | 95% | 1.527 | 2.194 | 335 | 864 | 1.143 | 3% | 4% |
| PUTUMAYO | 61% | 77% | 77% | 89% | 89% | 2.496 | 1.193 | 1.169 | 499 | 479 | 2% | 2% |
| QUINDIO | 87% | 102% | 101% | 100% | 101% | 906 | -103 | -71 | 2 | -44 | 0% | 0% |
| RISARALDA | 98% | 100% | 100% | 100% | 100% | 265 | 3 | 48 | 1 | -15 | 0% | 0% |
| SAN ANDRES | 91% | 100% | 99% | 105% | 100% | 82 | 1 | 7 | -39 | -2 | 0% | 0% |
| SANTANDER | 98% | 95% | 94% | 94% | 95% | 694 | 1.795 | 2.072 | 1.866 | 1.676 | 6% | 6% |
| SUCRE | 93% | 98% | 101% | 98% | 103% | 1.068 | 248 | -101 | 264 | -395 | 1% | 0% |
| TOLIMA | 85% | 91% | 94% | 97% | 99% | 3.184 | 1.820 | 1.246 | 461 | 251 | 1% | 1% |
| VALLE | 90% | 89% | 91% | 93% | 96% | 6.026 | 6.808 | 5.984 | 3.957 | 2.543 | 12% | 9% |
| VAUPES | 71% | 74% | 92% | 79% | 43% | 247 | 225 | 62 | 163 | 508 | 0% | 2% |
| VICHADA | 73% | 63% | 70% | 60% | 49% | 266 | 380 | 369 | 584 | 792 | 2% | 3% |



EPI

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Coverage analysis at the local levels

Absolute, relative differences and percentage distribution of the undercoverage at local level, from 2010 to 2014.

The 9 territories highlighted in the table, of the 32 territories in the country, 78% and 80% of coverage focuses on the country in 2013 and 2014 respectively.



Source: NSO and MoH-EPI(BCG). Own calculations.

* Bogotá is contained in the department of Cundinamarca, due to the large volume of human mobility because of the quality of the health centers of the capital city.

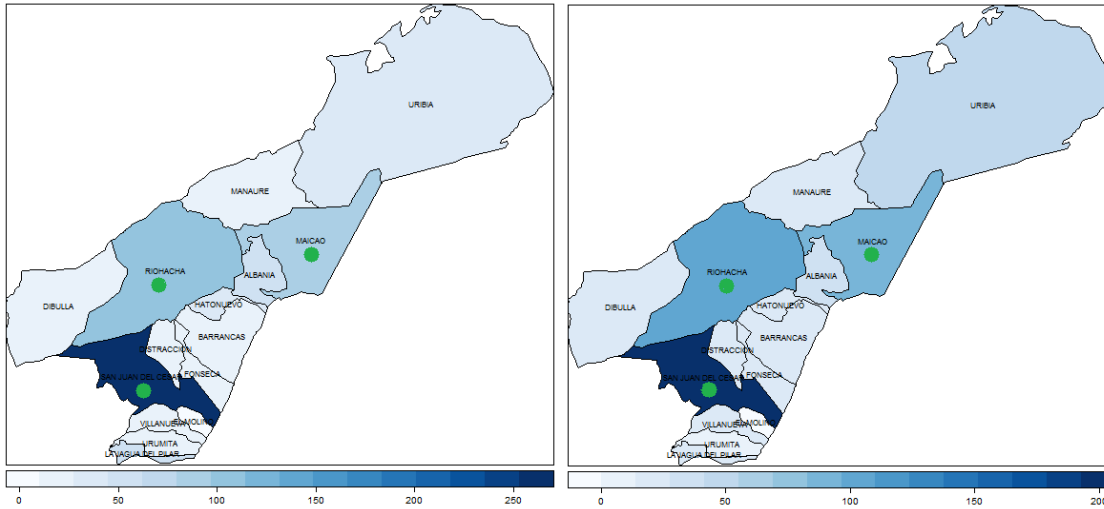


Analysis of coverage at the municipal level

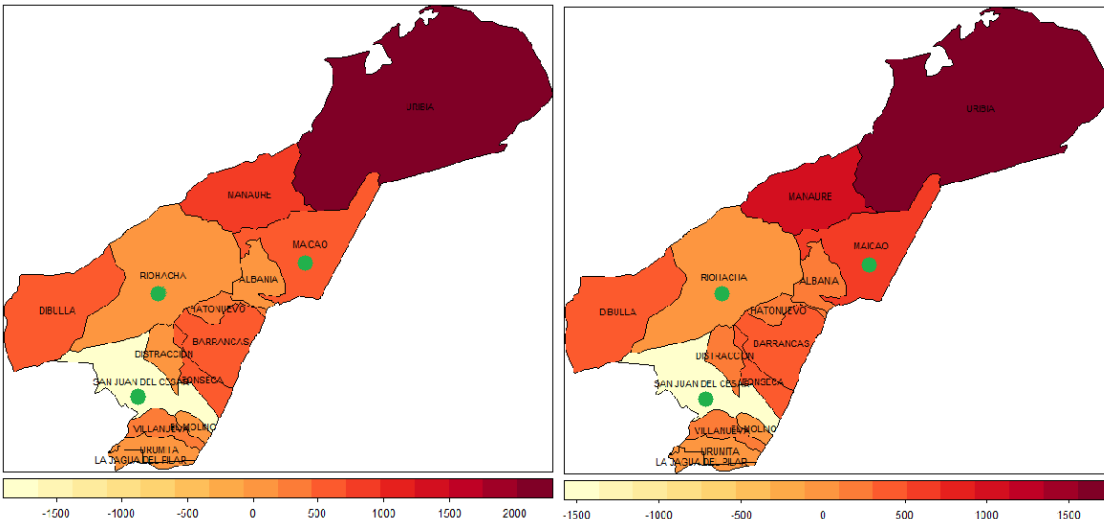
2013

2014

Relative differences
(VS/ EPI)



Absolute differences
(EPI-VS)



Map of relative differences and absolute for the territory of La Guajira from 2013 to 2014.

Monitoring and strengthening of the VS registry at municipal level.

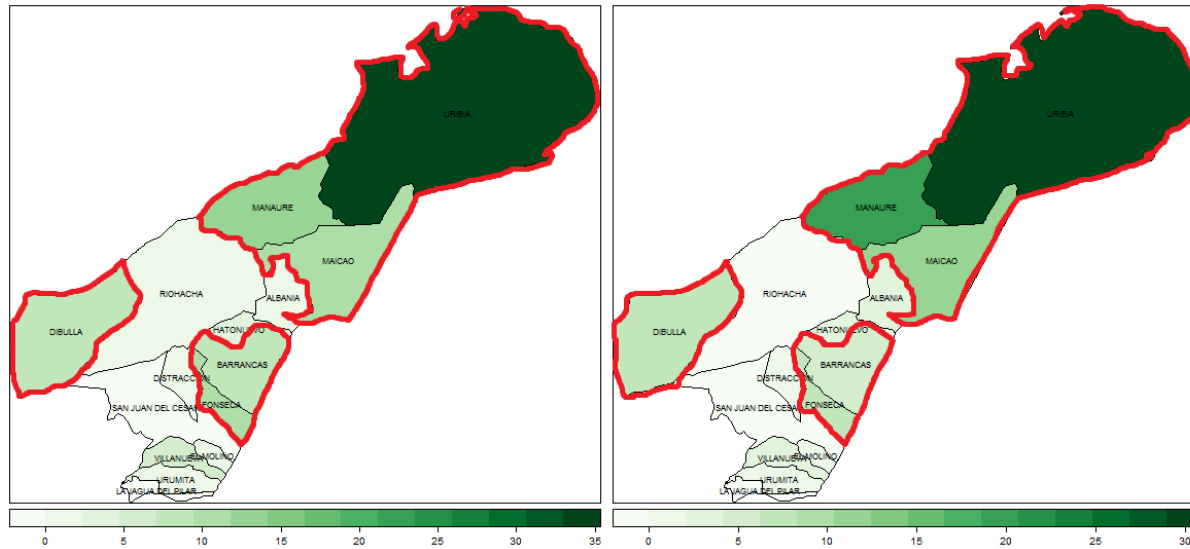




Expanded Program on Immunization (EPI)

2013

2014



Distribution of percentage undercoverage

Where can we improve the coverage of EEVV in La Guajira?

The 6 municipalities highlighted in the figure, of the 15 in the department, 82% and 83% of under-coverage focuses on the department in 2013 and 2014 respectively.

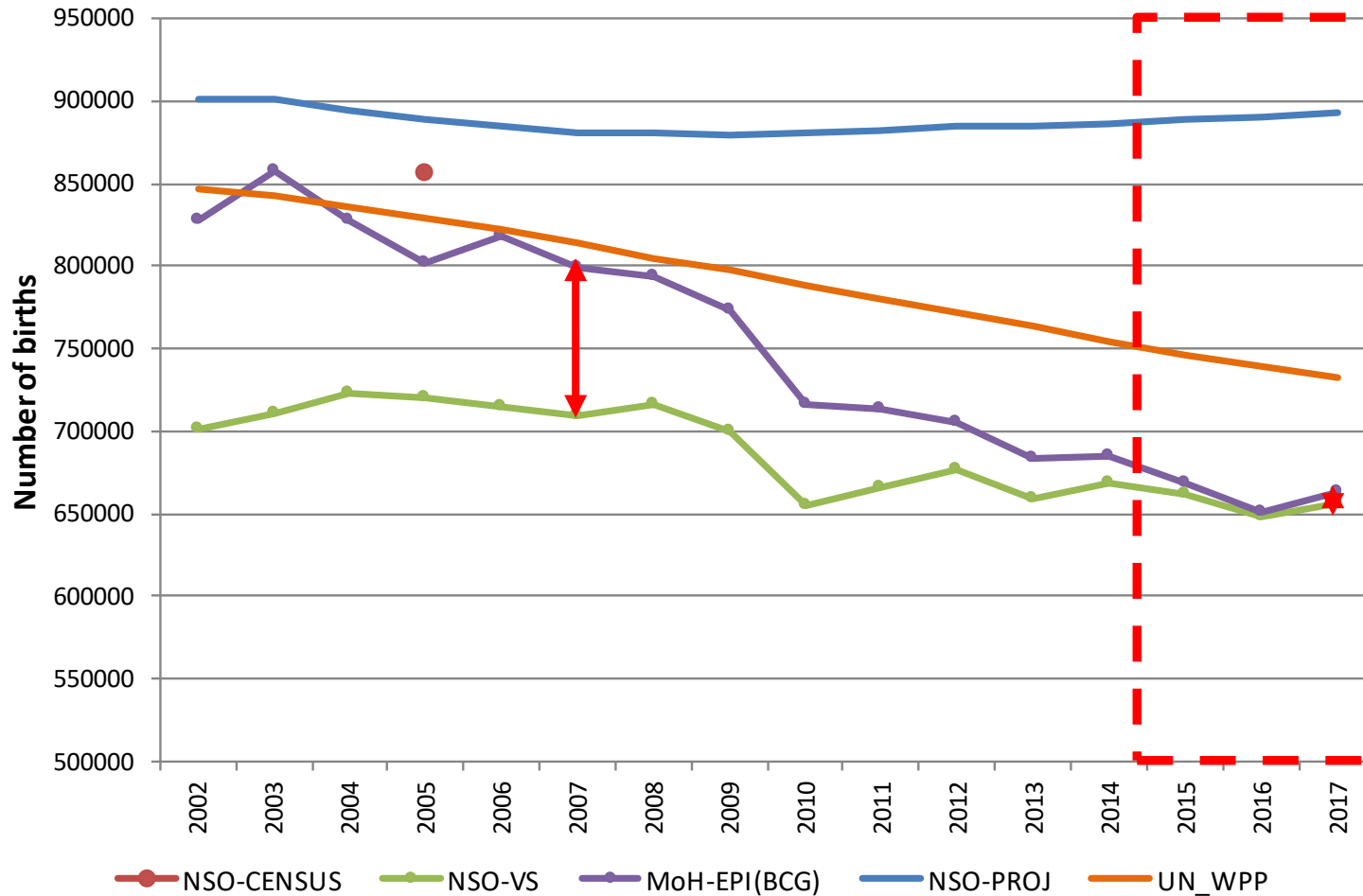


3 Results





Expanded Program on Immunization (EPI)



Update of results of the exercise according to the latest available data



Estimation of ASFR through a coverage adjustment

| | RELATIVE DIFFERENCE | | | | | | | | | | ABSOLUTE DIFFERENCE | | | | | | | | | |
|------------|---------------------|------|------|------|------|------|------|------|------|------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| CHOCO | 44% | 47% | 51% | 52% | 51% | 58% | 59% | 60% | 55% | 57% | 6.596 | 5.678 | 4.921 | 5.149 | 5.353 | 4.384 | 4.428 | 3.872 | 4.094 | 3.945 |
| LA GUAJIRA | 75% | 75% | 80% | 74% | 75% | 75% | 83% | 86% | 87% | 89% | 4.182 | 4.242 | 3.071 | 4.533 | 4.469 | 4.474 | 2.981 | 2.385 | 2.419 | 2.194 |

| | | AGE-SPECIFIC FERTILITY RATES PER YEAR | | | | | | | | | | | | | | | | | |
|-------------------|-------|---------------------------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | 2003 | DHS | 2004 | 2005 | 2006 | 2007 | 2008 | DHS | 2009 | 2010 | 2011 | 2012 | 2013 | DHS | 2014 | 2015 | 2016 | 2017 |
| AGE OF THE MOTHER | 10-14 | 0,003 | 0,003 | 0,004 | 0,004 | 0,004 | 0,004 | 0,004 | 0,004 | 0,004 | 0,003 | 0,003 | 0,003 | 0,003 | 0,002 | 0,003 | 0,003 | 0,003 | 0,003 |
| | 15-19 | 0,094 | 0,090 | 0,094 | 0,091 | 0,091 | 0,090 | 0,089 | 0,084 | 0,086 | 0,079 | 0,079 | 0,081 | 0,076 | 0,075 | 0,073 | 0,069 | 0,065 | 0,064 |
| | 20-24 | 0,143 | 0,132 | 0,141 | 0,138 | 0,132 | 0,127 | 0,124 | 0,122 | 0,119 | 0,109 | 0,108 | 0,108 | 0,103 | 0,112 | 0,102 | 0,098 | 0,095 | 0,094 |
| | 25-29 | 0,115 | 0,116 | 0,115 | 0,113 | 0,111 | 0,108 | 0,107 | 0,100 | 0,102 | 0,093 | 0,091 | 0,088 | 0,084 | 0,092 | 0,085 | 0,084 | 0,081 | 0,081 |
| | 30-34 | 0,084 | 0,077 | 0,082 | 0,080 | 0,076 | 0,073 | 0,072 | 0,070 | 0,071 | 0,067 | 0,067 | 0,067 | 0,064 | 0,068 | 0,065 | 0,064 | 0,060 | 0,059 |
| | 35-39 | 0,046 | 0,046 | 0,045 | 0,045 | 0,043 | 0,042 | 0,041 | 0,038 | 0,040 | 0,037 | 0,037 | 0,035 | 0,034 | 0,038 | 0,035 | 0,035 | 0,034 | 0,035 |
| | 40-44 | 0,014 | 0,015 | 0,014 | 0,013 | 0,013 | 0,012 | 0,012 | 0,012 | 0,011 | 0,010 | 0,010 | 0,010 | 0,010 | 0,009 | 0,009 | 0,009 | 0,009 | 0,009 |
| | 45-49 | 0,001 | 0,002 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,002 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 |
| TFR | | 2,50 | 2,4 | 2,48 | 2,42 | 2,35 | 2,29 | 2,25 | 2,10 | 2,16 | 2,00 | 1,98 | 1,96 | 1,88 | 2,00 | 1,87 | 1,81 | 1,74 | 1,73 |



4 Findings





Findings

- (i) These results strengthens the evidence for raising awareness and executing actions that **reduce the gaps** in the coverage and quality of information, which translates into **better decisions** in the territories.
- (ii) If we want to **see progress** (or improvements) in the **coverage** of VS, we must work to strengthen the system in small areas of the country.
- (iii) With the monitoring of births in the country through other registers (EPI case), **the planning problems mentioned for MoH and education can be avoided.**
- (iv) With the historical correction of the ASFR, tools are provided for the **best understanding of the pattern and level of fertility of the country**, through the VS.
- (v) These estimations **represents a way to investigate and describe the dynamic retrospective of fertility**, ensuring time and quality estimates



5

Challenges and recommendations



Challenges and recommendations

- (i) Manage this experience to strengthen statistical information in other territories with **local decision makers who are not experts in population studies.**
- (ii) Achieve **cohesion of actions** with other governmental and non-governmental teams to serve the vulnerable population.
- (iii) Replicate exercise for others territories.
- (iv) For the measure of SDG index, EPI help as supplementary source, to understand better the adolescent fertility rate, infant mortality and maternal mortality.





6 References



References

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