

DEMOGRAPHYC MODEL OF THE DYNAMICS OF MEXICO

October 2015

Designed models on DEMODIN

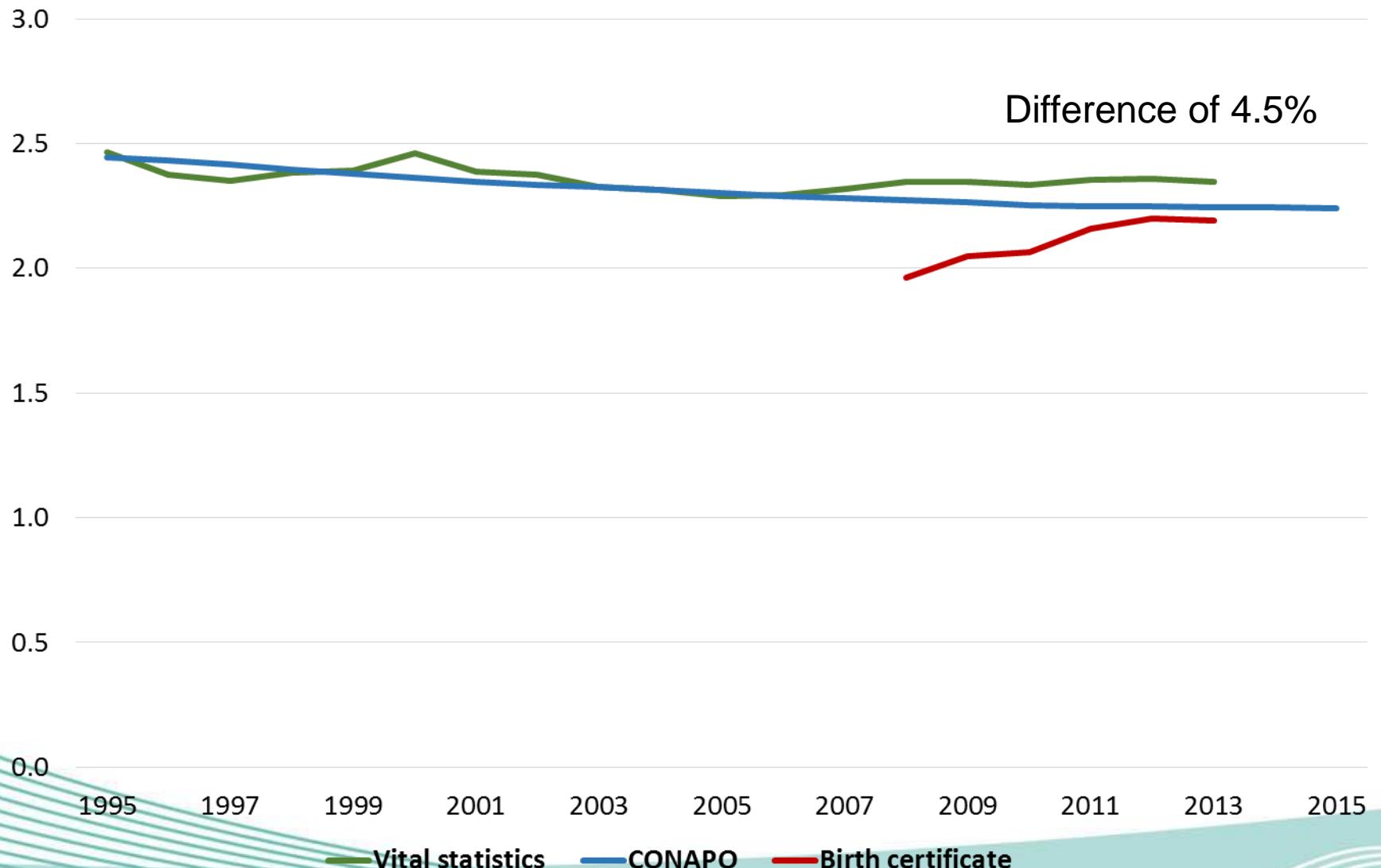
- Demographyc components monitoring
 - National model by breakdown age
 - State models by breakdown age (32 models)
 - State model by gross rates
 - Simplified model with factors of change
- Population model of Aguascalientes basin for Environment model.

Designed models on DEMODIN

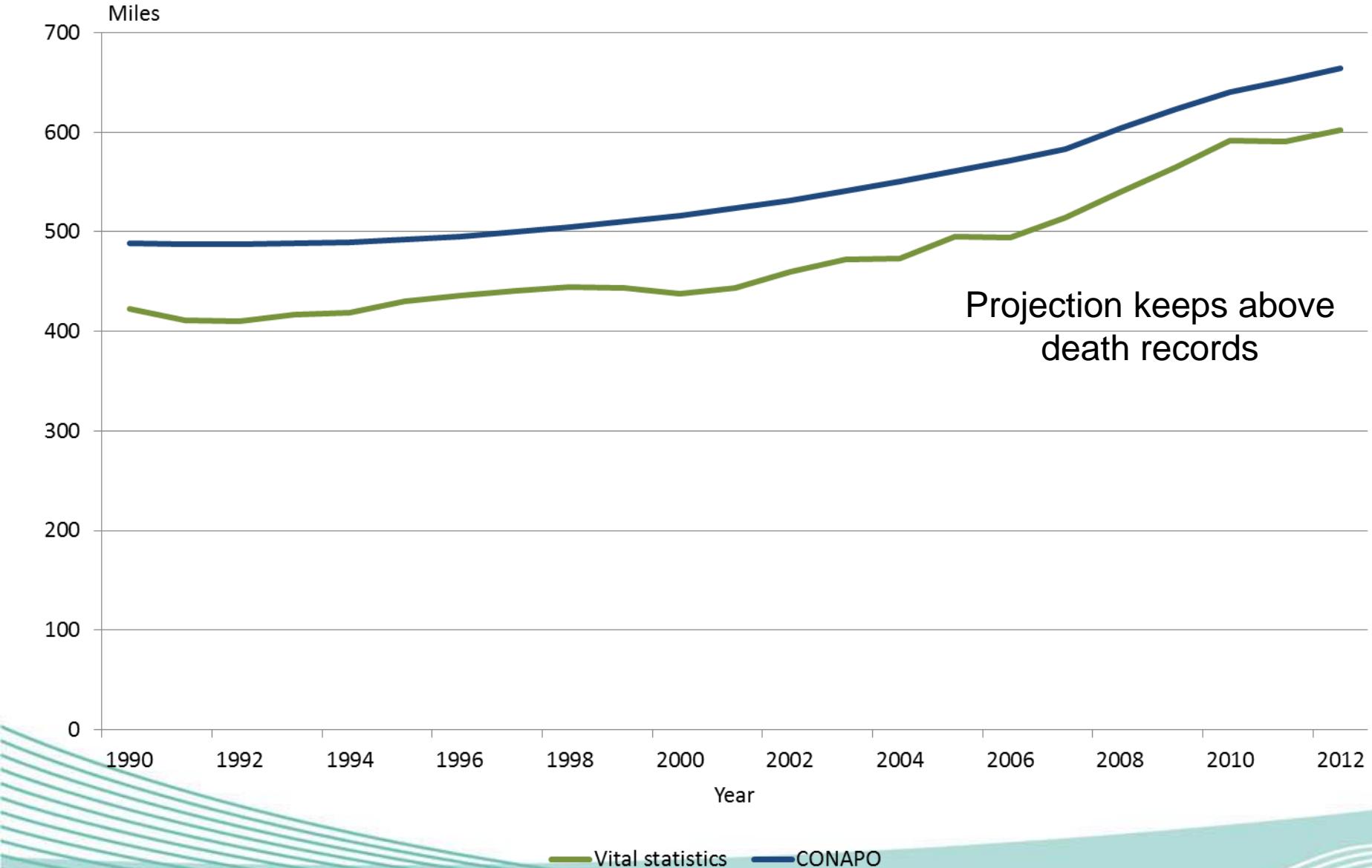
- SEDESOL program model:
 - Life insurance for female head of family
- Model of the Illiterate population (under construction)

Demographyc components monitoring

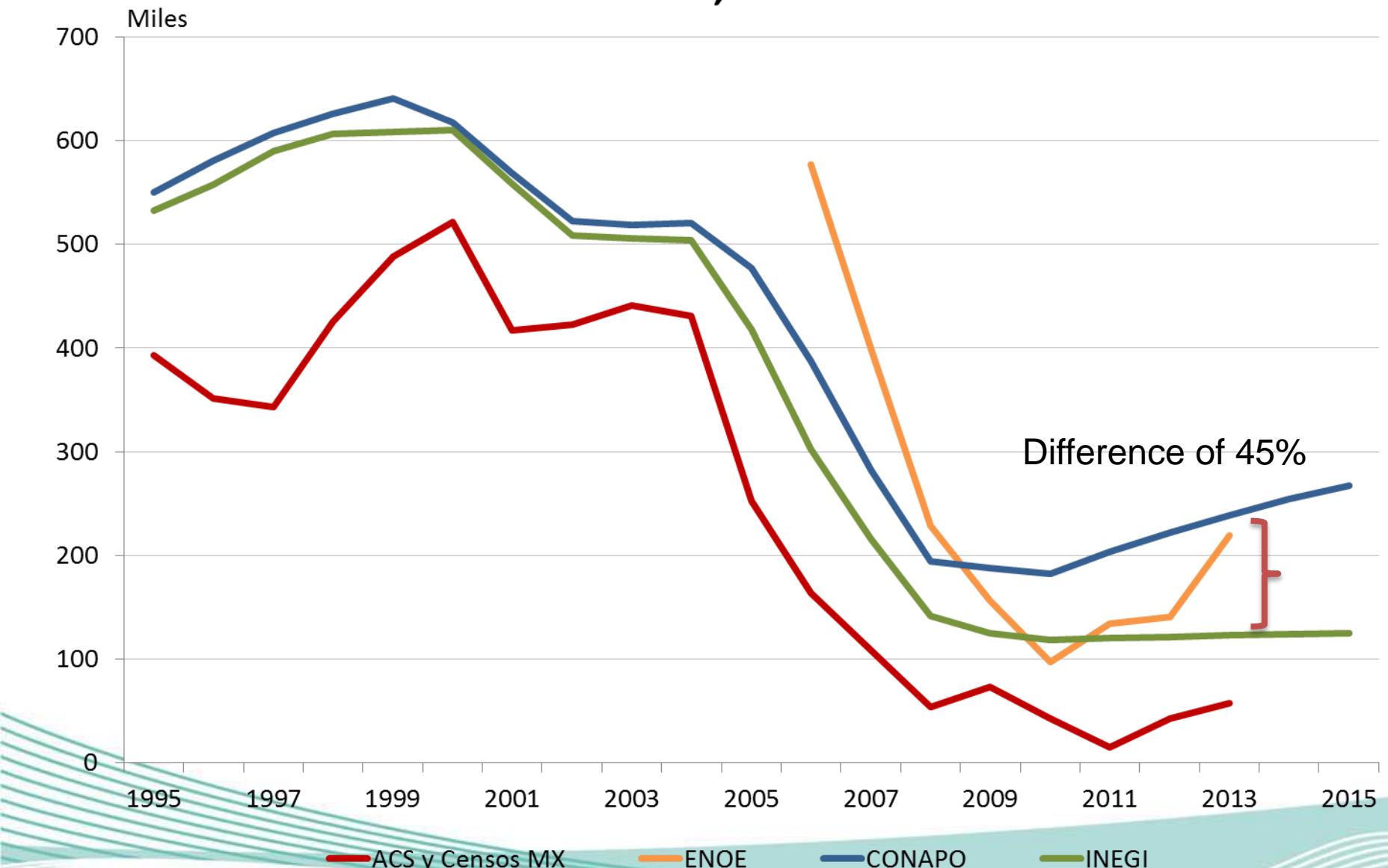
Number of Births by different resources, 1995-2015



General deaths according to resource, 1990-2012



Net loss due international migration according to resource, 1995-2015



Demographic indicators for 2010-2015 quinquennial according to resource

Annual averages

Indicator	CONAPO ¹	INEGI	CELADE ²	United Nations ³
Population 2010 (millions)	114.2 millions	112.3 millions ⁴	115.3 millions	118.6 millions
Population 2015 (millions)	121.0 millions	119.7 millions	121.8 millions	127.0 millions
Births (annual average in millions)	2.25 millions	2.34 millions ⁵	2.25 millions	2.37 millions
Deaths (annual average in thousands)	662 thousands	604 thousands ⁶	574 thousands	585 thousands
Migration (annual average in thousands)	-220 thousands	-120 thousands ⁷	-373 thousands	-105 thousands

1.CONAPO. Projections of the population of Mexico 2010-2050

2. CELADE. Long time 1950-2100 Population Estimates and projections. The 2013 Revision

3. Naciones Unidas. World Population Prospects. The 2015 Revision.

4. INEGI. Population and Housing Census 2010.

5. INEGI. Statistics of Natality, 2010-2013 Data Base. 2014-2015 Own estimates.

6. INEGI. Statistics of Mortality, 2010-2013 Data Base. 2014-2015 Own estimates.

7. INEGI. National survey of occupational and employment in Mexico 2006-2014; Population and Housing Census 2010, U.S. Census Bureau. American Community Survey 2000-2012. INEGI. Population and Housing Census 2010.

Model for the Population of Río San Pedro, Aguascalientes

Population of Río San Pedro, Aguascalientes

- It includes the population of 7 of 11 municipalities.
- The 2005 population was considered as basis.
- The Dynamic Demographic of Aguascalientes was taken as base of estimation.
- A factor of change was used in each one of components, it lets to have a model 15% more little than first one.

Pyramid of Population of Río San Pedro, Aguascalientes

2005

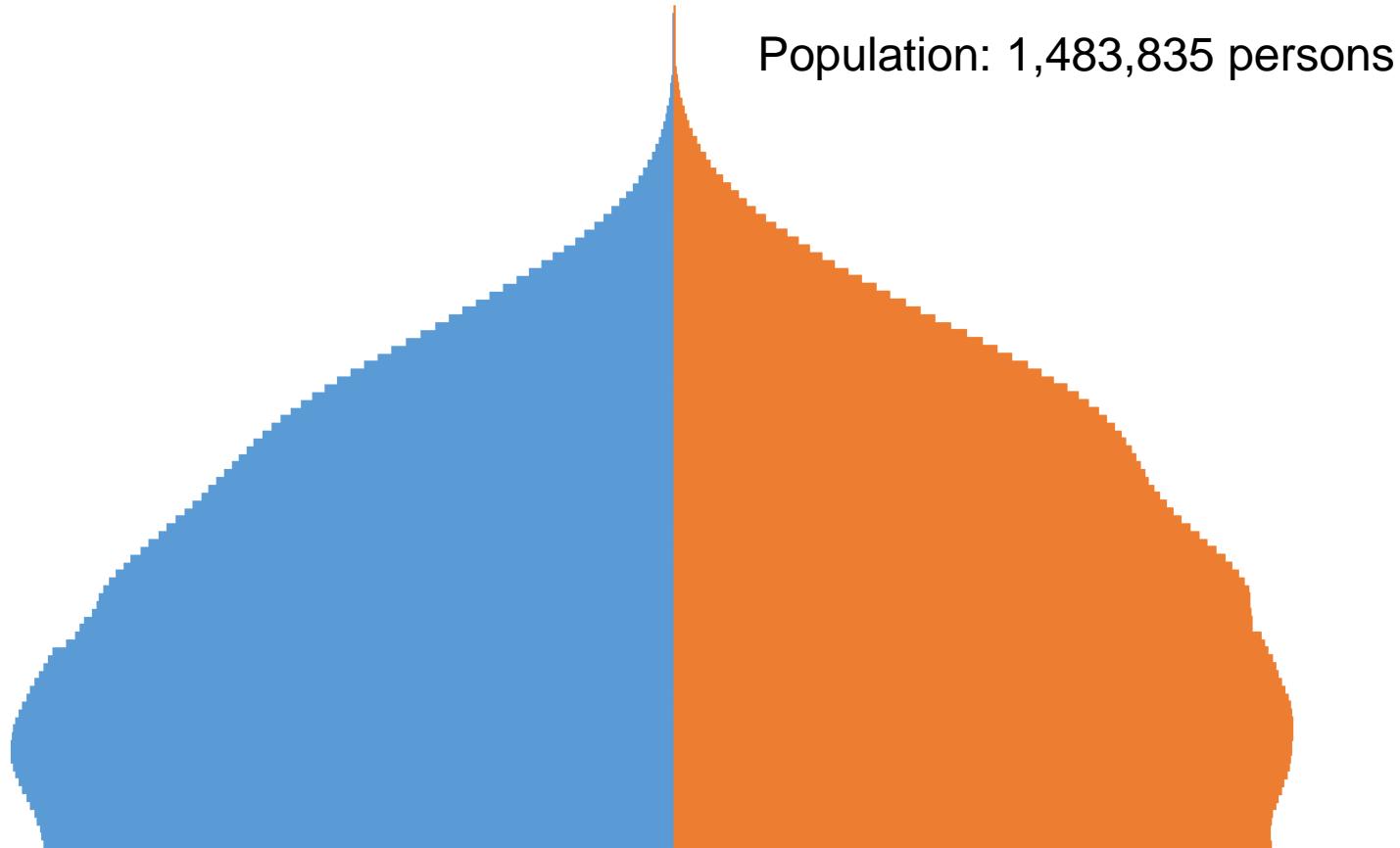
Population: 979,510 persons



Fuente: estimaciones propias a partir del Conteo de Población y Vivienda 2005 y el Censo de Población y Vivienda 2010.

Pyramid of Population of Río San Pedro, Aguascalientes

2030



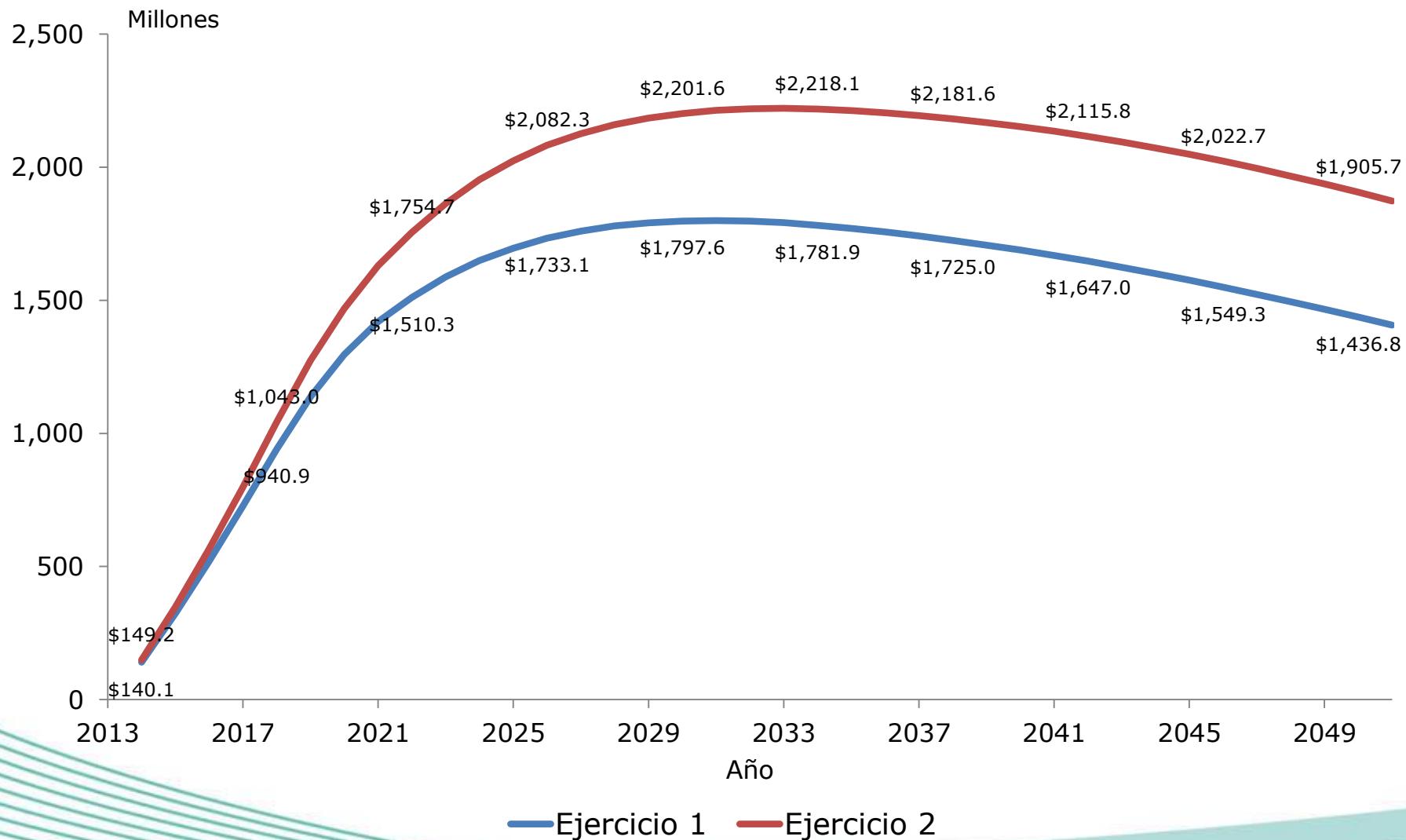
Fuente: estimaciones propias a partir del Conteo de Población y Vivienda 2005 y el Censo de Población y Vivienda 2010.

Model for program: Life insurance for female head of family (SEDESOL)

General features

- The Program is directed to female heads of family who are under vulnerability conditions to include them in a life insurance.
- To be insured the women must be 12 till 68 years old and having sons less than 24 years old.
- Main purpose is protect or promote scholar assistance of sons in case of death of mother .
- The program coverage is at national level.

Estimation of amount of profit granted to sons of female heads of family that have deceased, 2010-2050



Fuente: **INEGI**. Estimaciones propias a partir del XII Censo General de Población y Vivienda 2000; Censo de Población y Vivienda 2010.

Model of Illiterate population

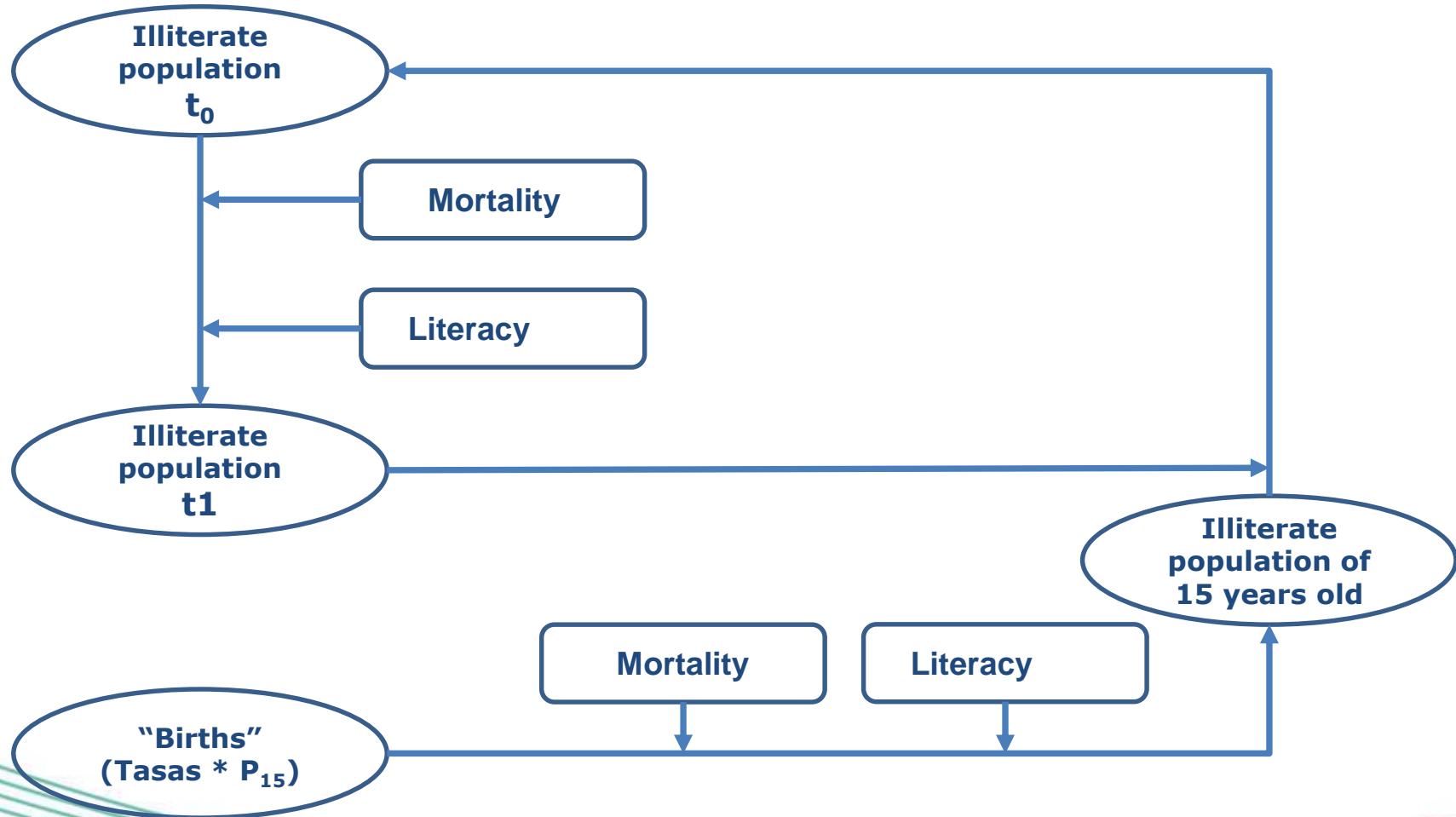
National Literacy Campaign and reducing the educational gap 2013-2018

- To alphabetize 2.2 millions of persons
- To reduce the number of persons that don't know to read and write, to reach 3.5% en 2018

Demographic prospective exercise

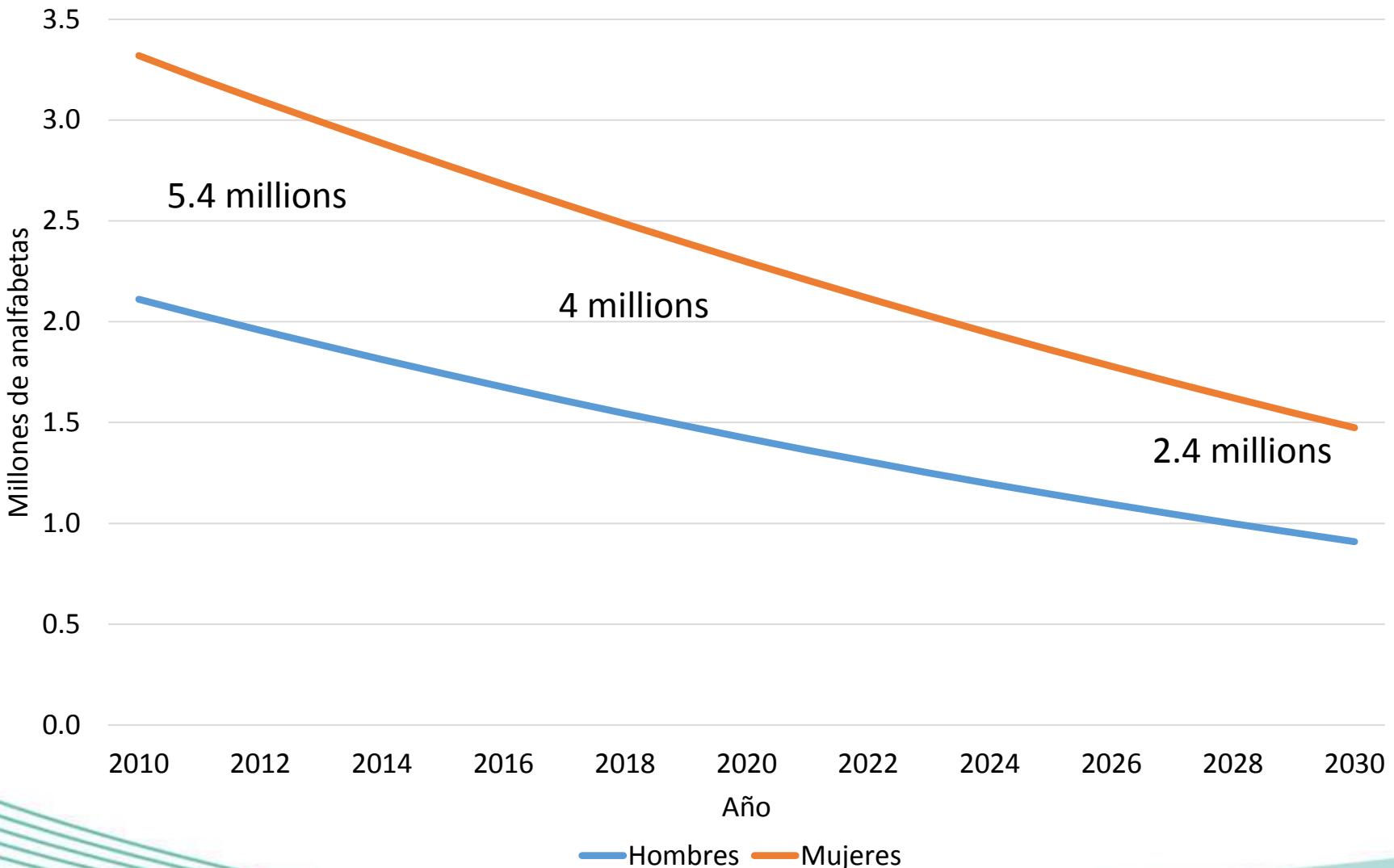
- Using the same principle of the projections of population by demographic components.
- For the similar of Fertility, it would consider the illiterate rate of 15 years old.
- For the similar of Mortality, it would consider the life expectancy from CONAPO's projections of population and the illiterate rates.
- In case of Migration, we propose don't consider it because the internal and international migration rates of the illiterate population are small.

Diagram that shows the demographic prospective method



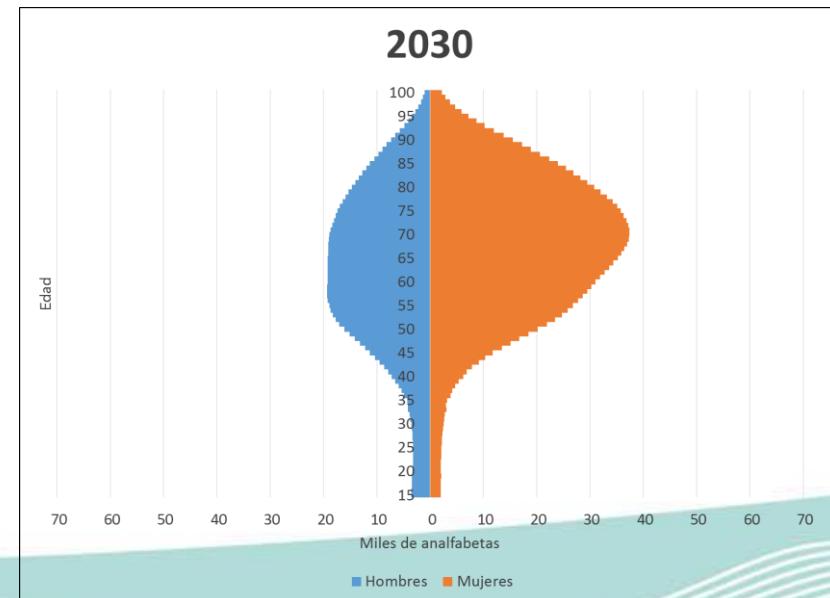
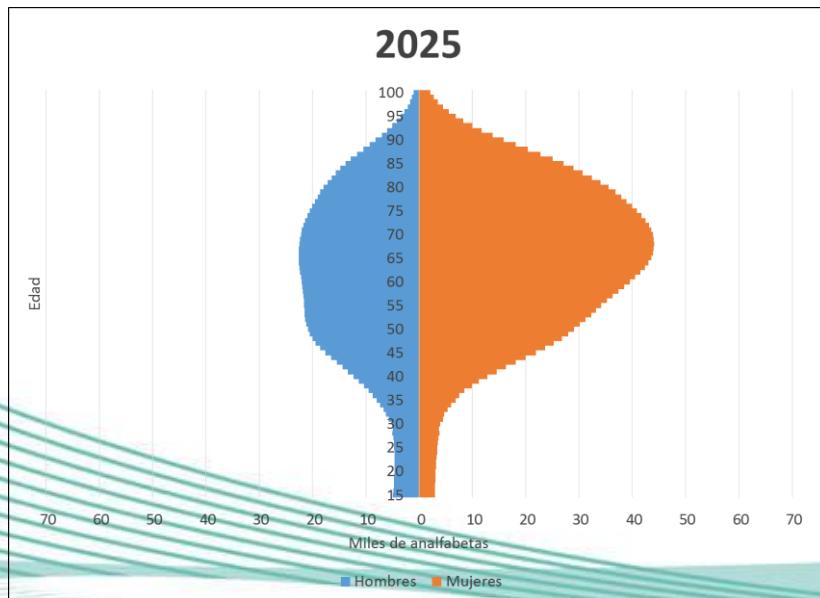
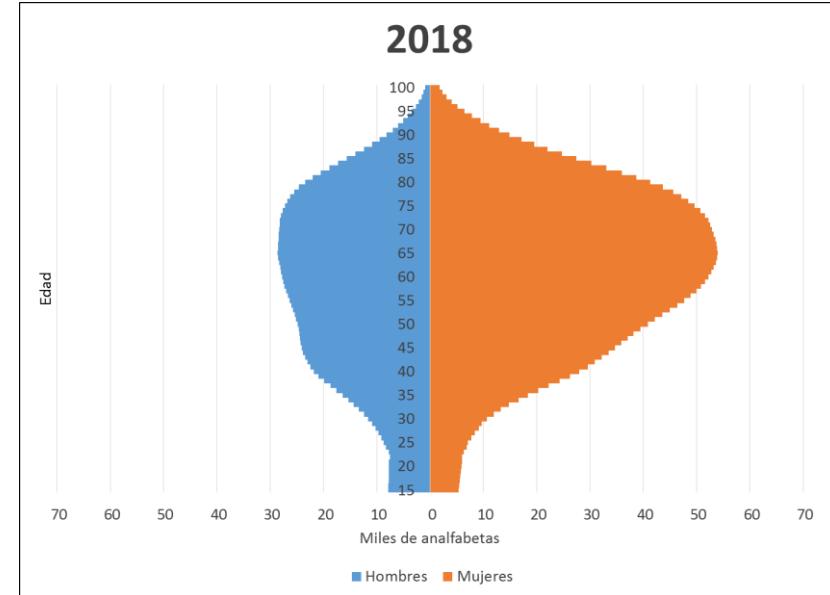
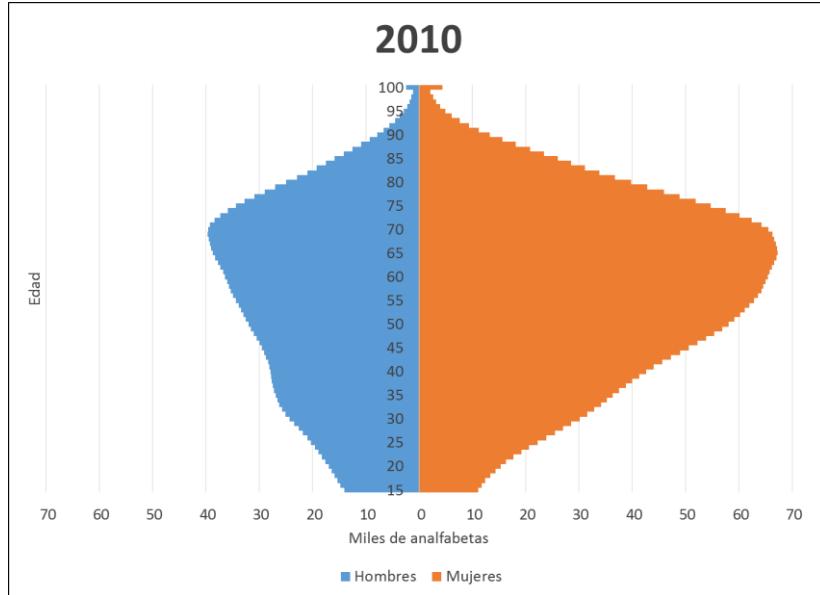
Estimation of Illiterate population 2010-2030

Estimation of Illiterate population by sex, 2010-2030



Fuente: INEGI. Estimaciones propias.

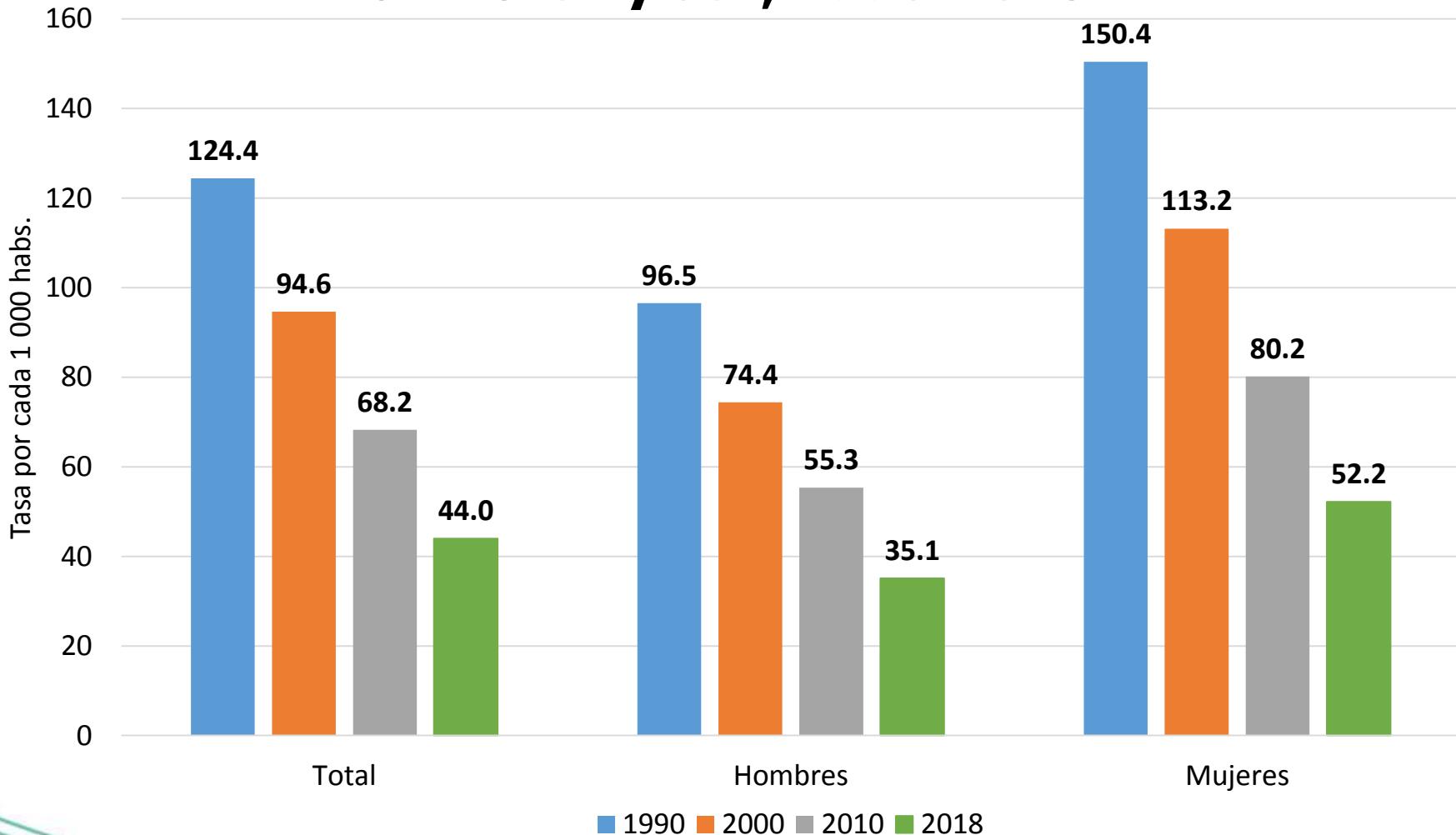
Pyramids of illiterate population, 2010-2030



Fuente: INEGI. Estimaciones propias.

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Illiteracy rates of the population of 15 years or more by sex, 1990-2018



Fuente: INEGI. XI Censo General de Población y Vivienda 1990.
XII Censo General de Población y Vivienda 2000.
Estimaciones propias.

Indicators estimating the illiterate population, 2010-2030

Indicator	2010	2015	2018	2020	2025	2030
<i>illiterate population</i>						
Total	5 430 349	4 525 146	4 030 329	3 718 786	3 004 438	2 384 128
Men	2 111 587	1 743 062	1 545 144	1 422 035	1 144 558	909 531
Women	3 318 762	2 782 084	2 485 185	2 296 751	1 859 880	1 474 597
<i>New illiterates</i>						
Total	24 839	17 110	13 641	11 725	8 352	5 803
Men	14 014	10 038	8 166	7 110	5 224	3 733
Women	10 825	7 072	5 475	4 615	3 128	2 070
<i>Deceased illiterate population</i>						
Total	134 113	118 375	113 302	109 401	98 206	85 736
Men	57 589	49 461	46 207	43 938	38 019	32 111
Women	76 524	68 914	67 095	65 463	60 187	53 625
<i>literate population</i>						
Total	89 377	69 210	59 788	54 431	43 477	34 921
Men	37 645	29 252	25 270	22 985	18 285	14 662
Women	51 732	39 958	34 518	31 446	25 192	20 259
<i>Increase of the illiterate population</i>						
Total	- 198 651	- 170 475	- 159 449	- 152 107	- 133 331	- 114 854
Men	- 81 220	- 68 675	- 63 311	- 59 813	- 51 080	- 43 040
Women	- 117 431	- 101 800	- 96 138	- 92 294	- 82 251	- 71 814
<i>Population aged 15 or more (DEMODIN Base 112.3 M)</i>						
Total	79 576 327	87 227 648	91 604 452	94 421 165	101 076 171	107 600 104
Men	38 175 512	41 865 157	44 002 223	45 381 781	48 648 872	51 870 959
Women	41 400 815	45 362 491	47 602 229	49 039 384	52 427 299	55 729 145
<i>Illiteracy rates (per thousand.)</i>						
Total	68.2	51.9	44.0	39.4	29.7	22.2
Men	55.3	41.6	35.1	31.3	23.5	17.5
Women	80.2	61.3	52.2	46.8	35.5	26.5

Source: INEGI. Own estimates.

Conclusions

- DemoDin México satisfies the needs of Demographic Analysis Directorate to monitor differences among observed statistics respect to hypothesis of the projections and their effects on the estimates of population
- The modeling tool was used in other projects that have been adequately in Dynamic Systems.
- We observe a considerable potential of the use of Dynamic Systems in diverse fields, they allow construct the **Probable, Possible and Desirable** evolution of phenomena for modeling.

Thank you!!

October 2015