Inequalities in life expectancies among Mexican states, 1990-2015: deterioration in adult survival

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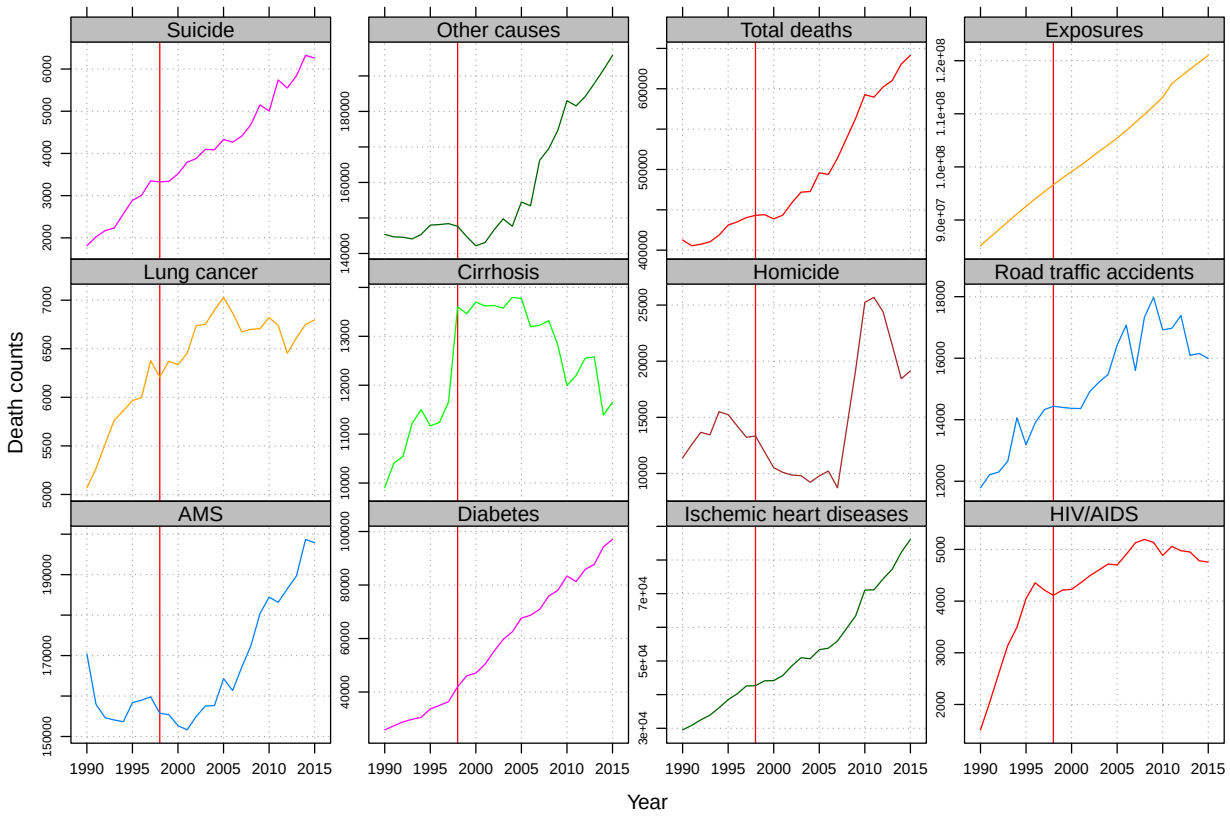
Supplemental material

Appendix Table 1. Definitions of cause-of-death categories using the 9th and 10th revision of the International Classification of Diseases.

Category	ICD-10	ICD-9
I. Amenable to medical service		
I.A. AM-Infectious & respiratory diseases : intestinal infections, tuberculosis, zoonotic bacterial diseases, other bacterial diseases, septicemia, poliomyelitis, measles, rubella, infectious hepatitis, ornithosis, rickettsioses/ arthropod-borne, syphilis (all forms), yaws, respiratory diseases, influenza & pneumonia, chronic lower respiratory diseases	A00-A09, A16-A19, B90, A20-A26, A28, A32, A33, A35, A36, A37, A40-A41, A80, B05-B06, B15-B19, A70, A68, A75, A77, A50-A64, A66, J00-J08, J20-J39, J60-J99, J09-J18, J40-J47	001-009, 010-018, 32, 33, 37, 137, 020-027, 38, 45, 55-56, 70, 73, 080-082, 087, 090-099, 102, 460-479, 500-519, 480-488, 490-496
I.B. AM-Cancers: malignant neoplasm of colon, skin, breast, cervix, prostate, testis, bladder, kidney-Wilm's tumor only, eye, thyroid carcinoma, Hodgkins disease, leukemia	C16,C18-C21, C43-C44, C50, C53, C61, C62, C67, C64, C69, C73, C81, C91-C95	153-154, 172-173, 174, 180, 185, 186, 188-189, 190, 193, 201, 204-208
I.C. AM-Circulatory: active/acute rheumatic fever, chronic rheumatic heart disease, hypertensive disease, cerebrovascular disease	I00-I02, I05-I09, I10-I13, I15, I60-I69	390-392, 393-398, 401-405, 430-438
I.D. AM-Birth: maternal deaths (all), congenital cardiovascular anomalies, perinatal deaths (excluding stillbirths)	O00-O99, Q20-Q28, P00-P96	630-676, 745-747, 760-779
I.E. AM-Other: disease of thyroid, epilepsy, peptic ulcer, appendicitis, abdominal hernia, cholelithiasis & cholecystitis, nephritis, benign prostatic hyperplasia, misadventures to patients during surgical or medical care, cisticerchosis	E00-E07, 40-G41, K25-K27, K35-K38, K40-K46, K80-K81, N00-N07, N17-N19, N25-N27, N40, Y60-Y69, Y83-Y84, B69	240-246, 345, 531-533, 540-543, 550-553, 574-575.1, 580-589, 600, E870-E876, E878-E879
II. Diabetes	E10-E14	250
III. Ischemic Heart Diseases (IHD)	I20-I25	410-414, 429.2
IV. Lung cancer	C33-C34	162
V. Cirrhosis	K70	571.1-571.3
VI. Homicides	X85-Y09	E960-E969
VII. Road traffic accidents	V01-V99	E810-E819
VIII. Residual Causes : HIV/AIDS; suicide and self-inflicted injuries; other cancers and other heart diseases	B20-B24, U03; X60-X84, Y87.0; C00-D48; I00-I99 if not listed above; R00-R99	042-044; E950-E959; 140-239; 390-459 if not listed above; 780-799

Figure 1: Cause-specific death counts (different y-scale for each cause), 1990-2010.



Note: AMS "amenable to medical service". The red line indicates the change from ICD 9 to ICD 10.

Temporary Life Expectancy

Temporary life expectancy between ages x_1 and x_2, for $x_1 < x_2$, is defined as the average years of life lived between these ages according to a given set of mortality rates (Arriaga 1984). We denote this quantity as ${}_{(x_2-x_1)}e_{x_1}$, and its benchmark based on minimum death rates for every age and cause of death among the Mexican states for each year as ${}_{(x_2-x_1)}e^{\star}_{x_1}$. Defined in terms of the lifetable survival function, $\ell(x)$:

$$ {}_{(x_2-x_1)}e_{x_1} = \frac{\int_{x_1}^{x_2} \ell(x)\, \mathrm{d}x}{\ell(x_1)} \tag{1} $$

If full survival is achieved, the life expectancy is $x_2 - x_1$. For example, if we set $x_1 = 0$ and $x_2 = 15$, and no person dies between the ages 0 and 15, on average the population lives 15 full years.

References

Arriaga, E. E. (1984). Measuring and explaining the change in life expectancies. *Demography*, 21(1):83–96.

Figure 2: Inequality in life expectancy between states for youngest (0-14), young adults (15-49), and older adults (50-84) by sex, 1990-2015.

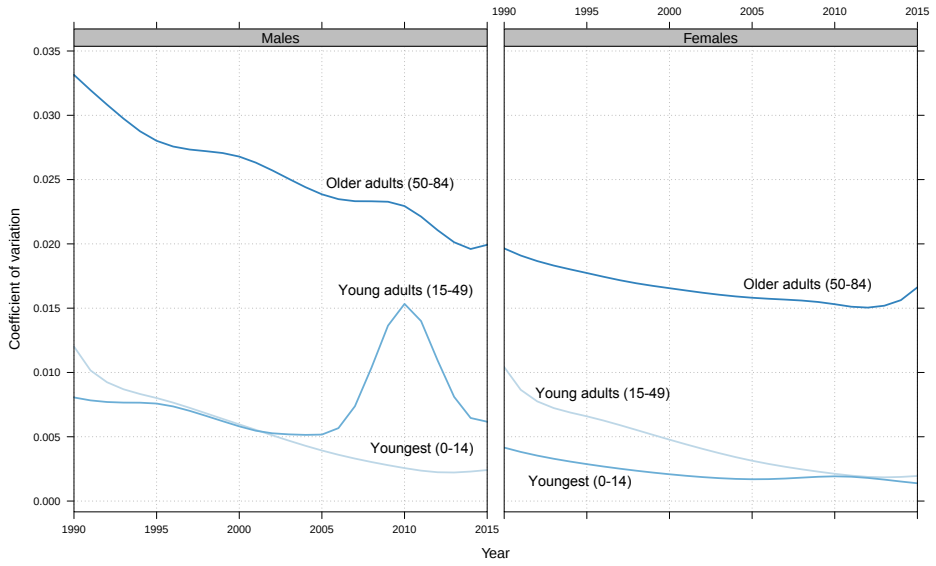
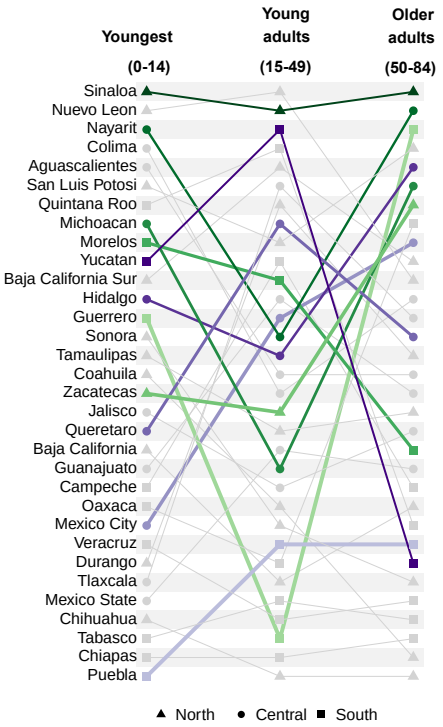
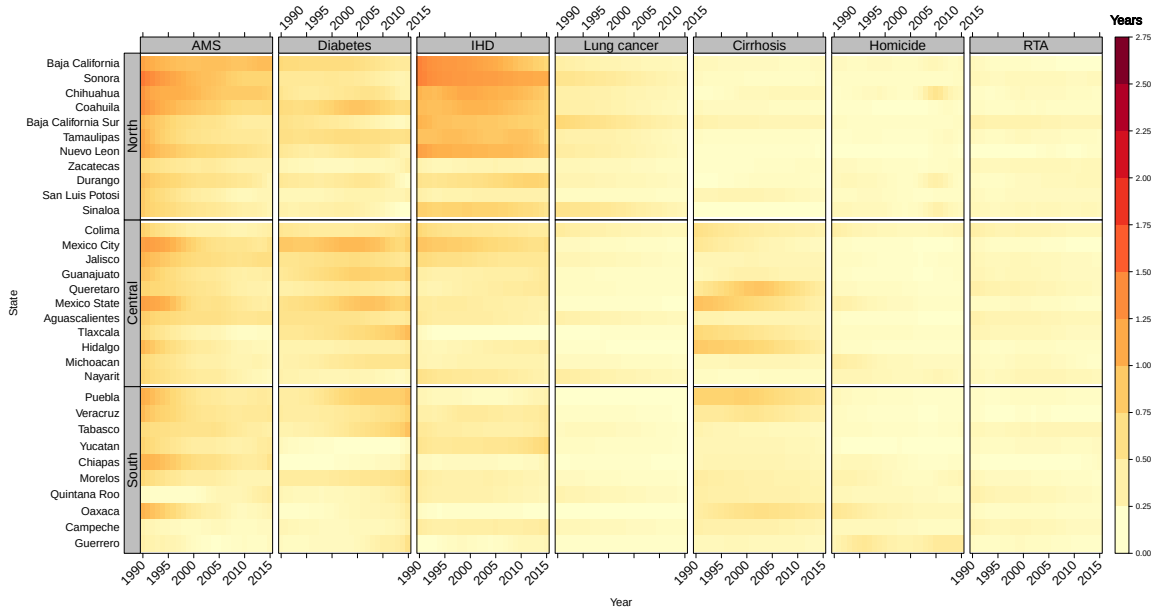


Figure 3: State ranking for average female life expectancy 2010-15 for the youngest (0-14), young adults (15-49), and older adults (50-84).



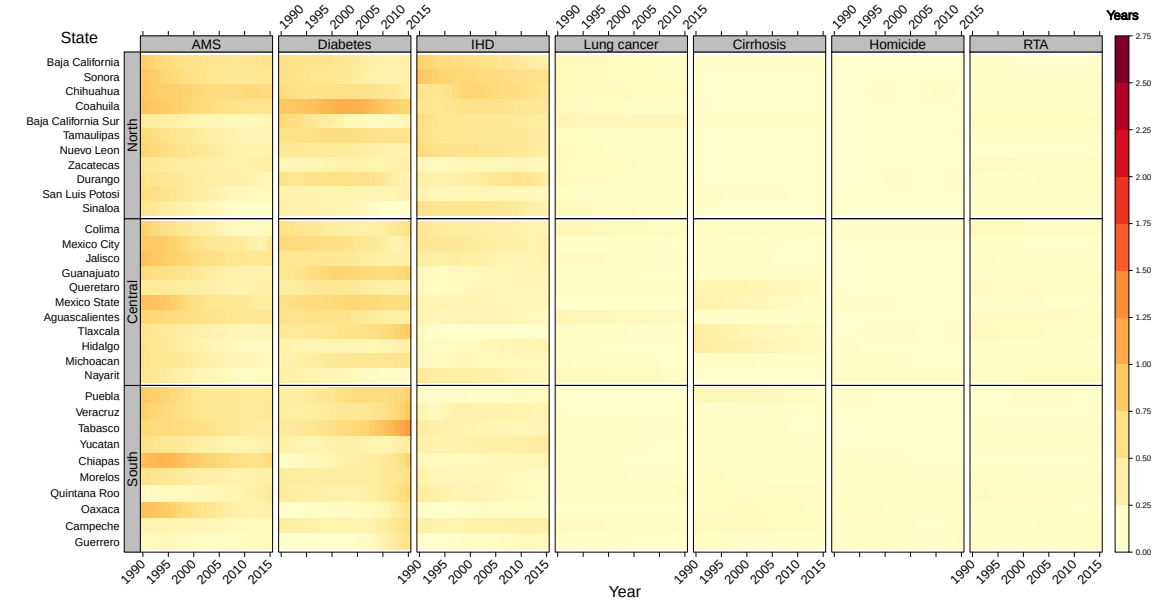
Source: calculations based on INEGI and CONAPO files.

Figure 4: Cause-specific contributions to state differences from low mortality benchmark for older male adults (ages 50-84), 1990-2015. States grouped into three regions. Reproduced from manuscript Figure 4 to have color scale comparable with other Supplementary figures. In subsequent figures 5-9 the color was rescaled to make them comparable over age groups in the supplemental material, the maximum value observed was 2.6 years caused by homicides in Chihuahua in 2010.



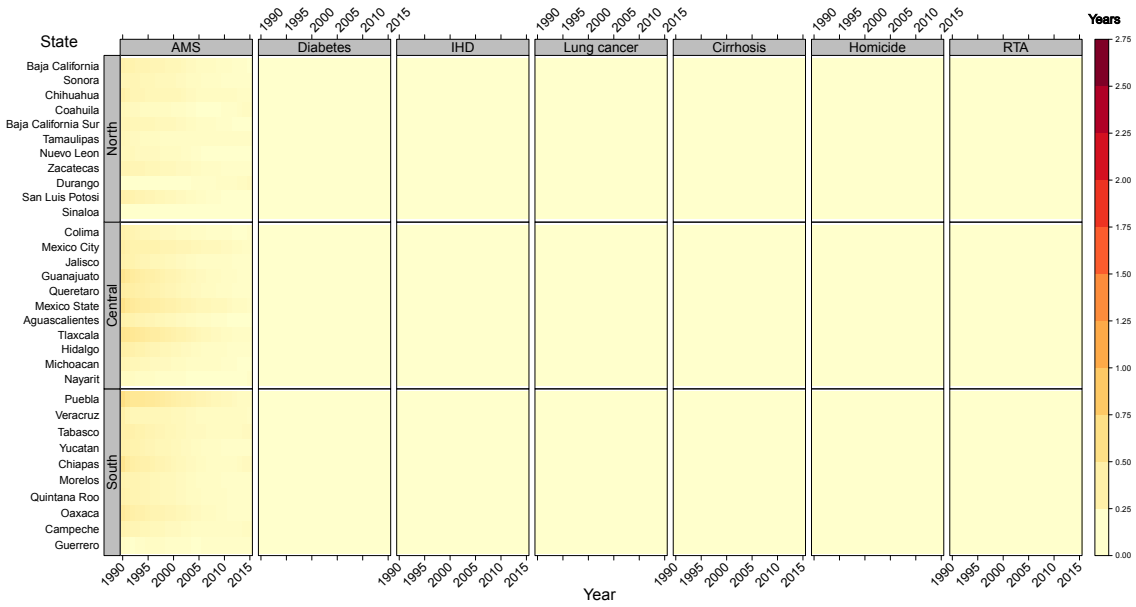
Note: AMS is "amenable to medical service", IHD is "isquemic heart diseases", and RTA is "road traffic accidents". Source: own calculations.

Figure 5: Cause-specific contributions to state differences from low mortality benchmark for older female adults (ages 50-84), 1990-2015.



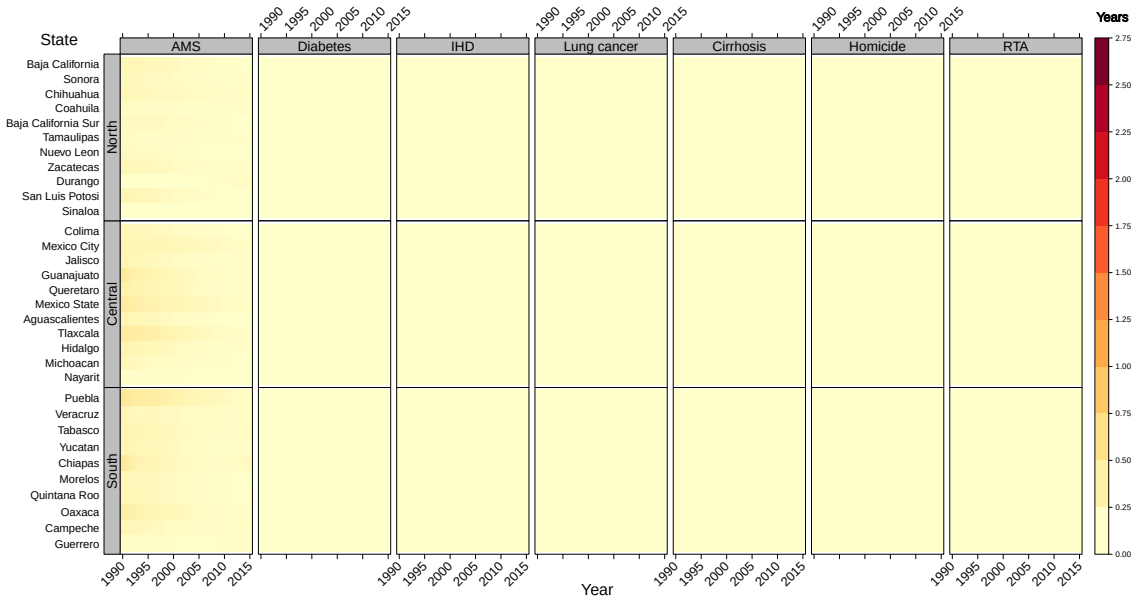
Note: AMS is "amenable to medical service", IHD is "isquemic heart diseases", and RTA is "road traffic accidents". Source: own calculations.

Figure 6: Cause-specific contributions to state differences from low mortality benchmark for male youngest population (ages 0-14), 1990-2015.



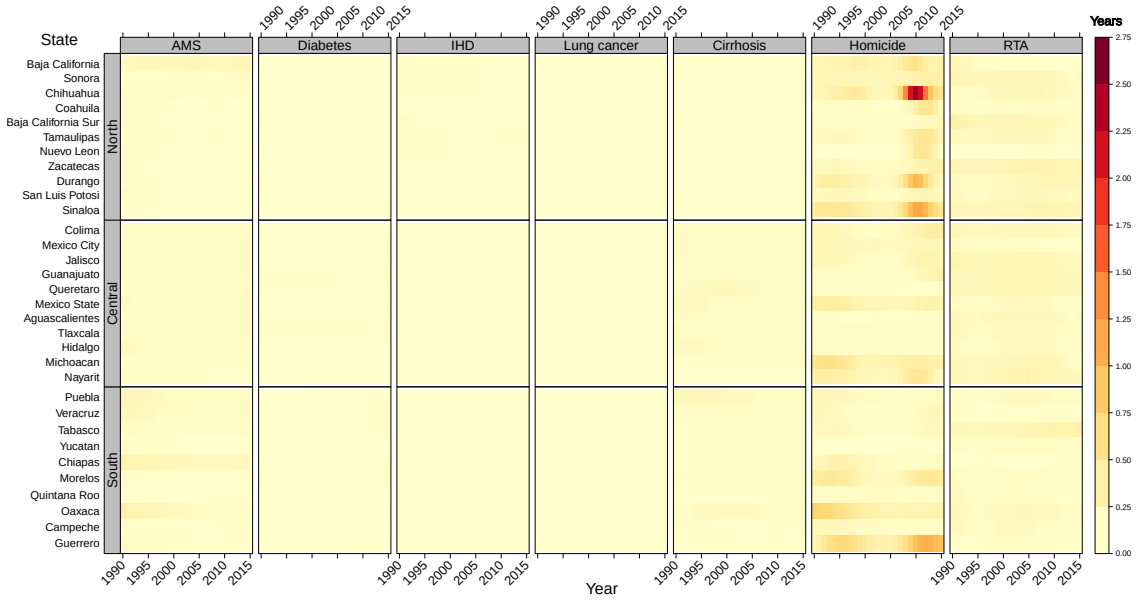
Note: AMS is "amenable to medical service", IHD is "isquemic heart diseases", and RTA is "road traffic accidents". Source: own calculations.

Figure 7: Cause-specific contributions to state differences from low mortality benchmark for female youngest population (ages 0-14), 1990-2015.



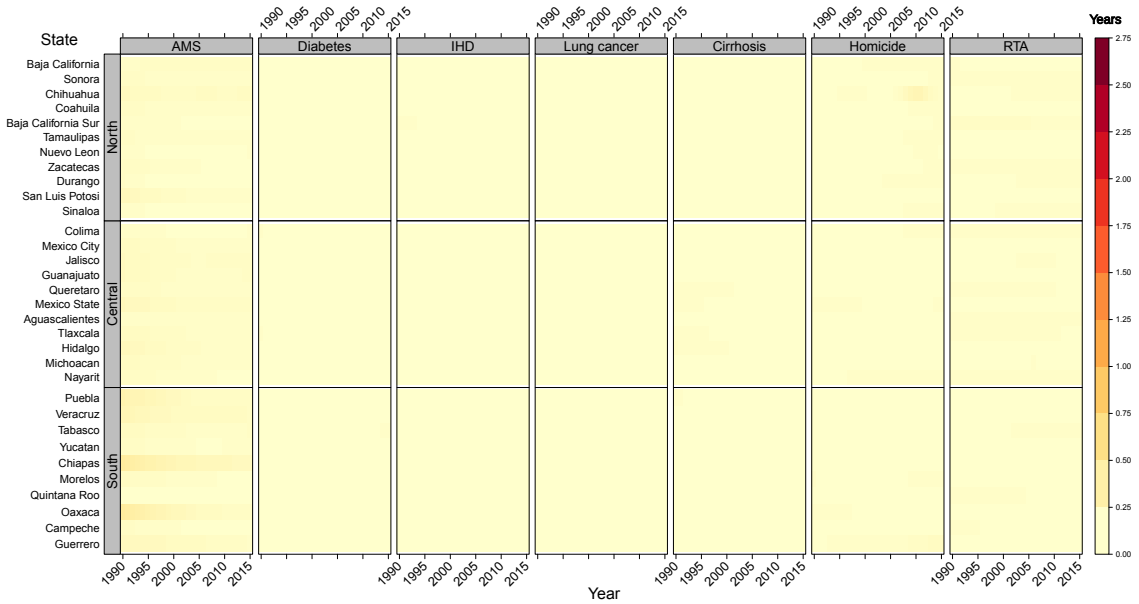
Note: AMS is "amenable to medical service", IHD is "isquemic heart diseases", and RTA is "road traffic accidents". Source: own calculations.

Figure 8: Cause-specific contributions to state differences from low mortality benchmark for male young adults (ages 15-49), 1990-2015.



Note: AMS is "amenable to medical service", IHD is "isquemic heart diseases", and RTA is "road traffic accidents". Source: own calculations.

Figure 9: Cause-specific contributions to state differences from low mortality benchmark for female young adults (ages 15-49), 1990-2015.



Note: AMS is "amenable to medical service", IHD is "isquemic heart diseases", and RTA is "road traffic accidents". Source: own calculations.

Figure 10: State specific gap with low mortality benchmark for selected years between ages 0-14. Source: own calculations.

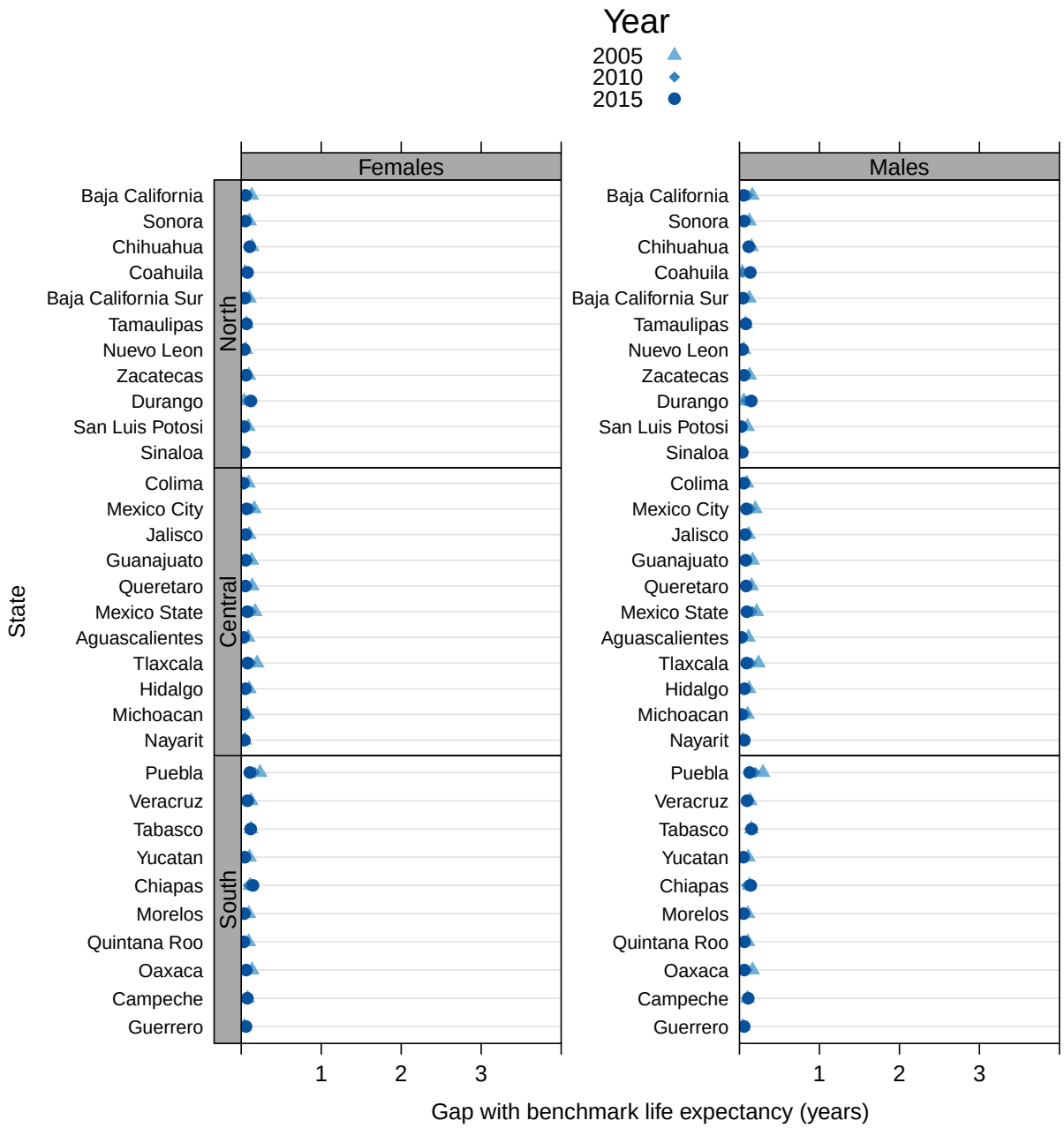


Figure 11: State specific gap with low mortality benchmark for selected years between ages 15-49. Source: own calculations.

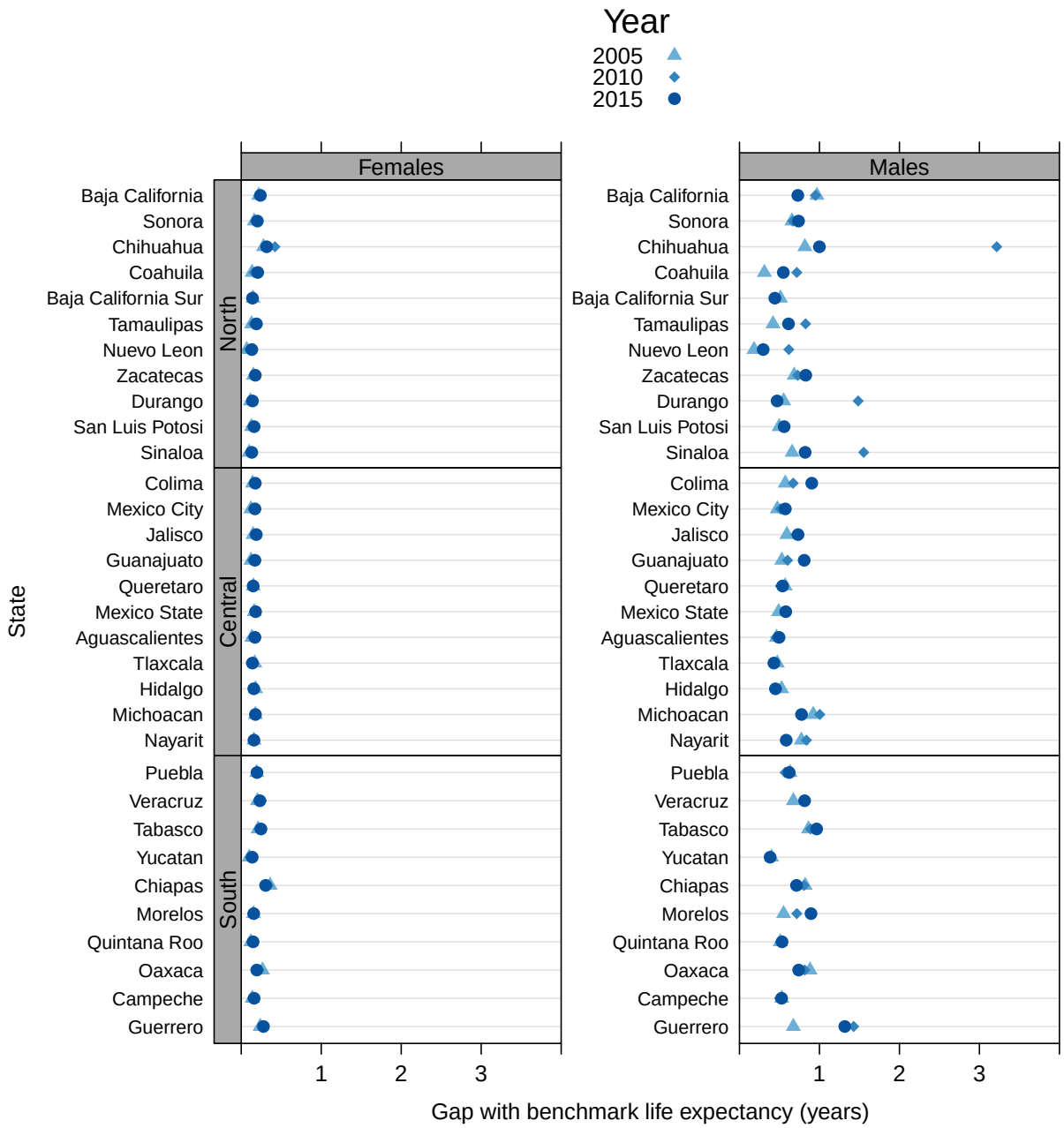


Figure 12: State specific gap with low mortality benchmark for selected years between ages 50-84. Source: own calculations.

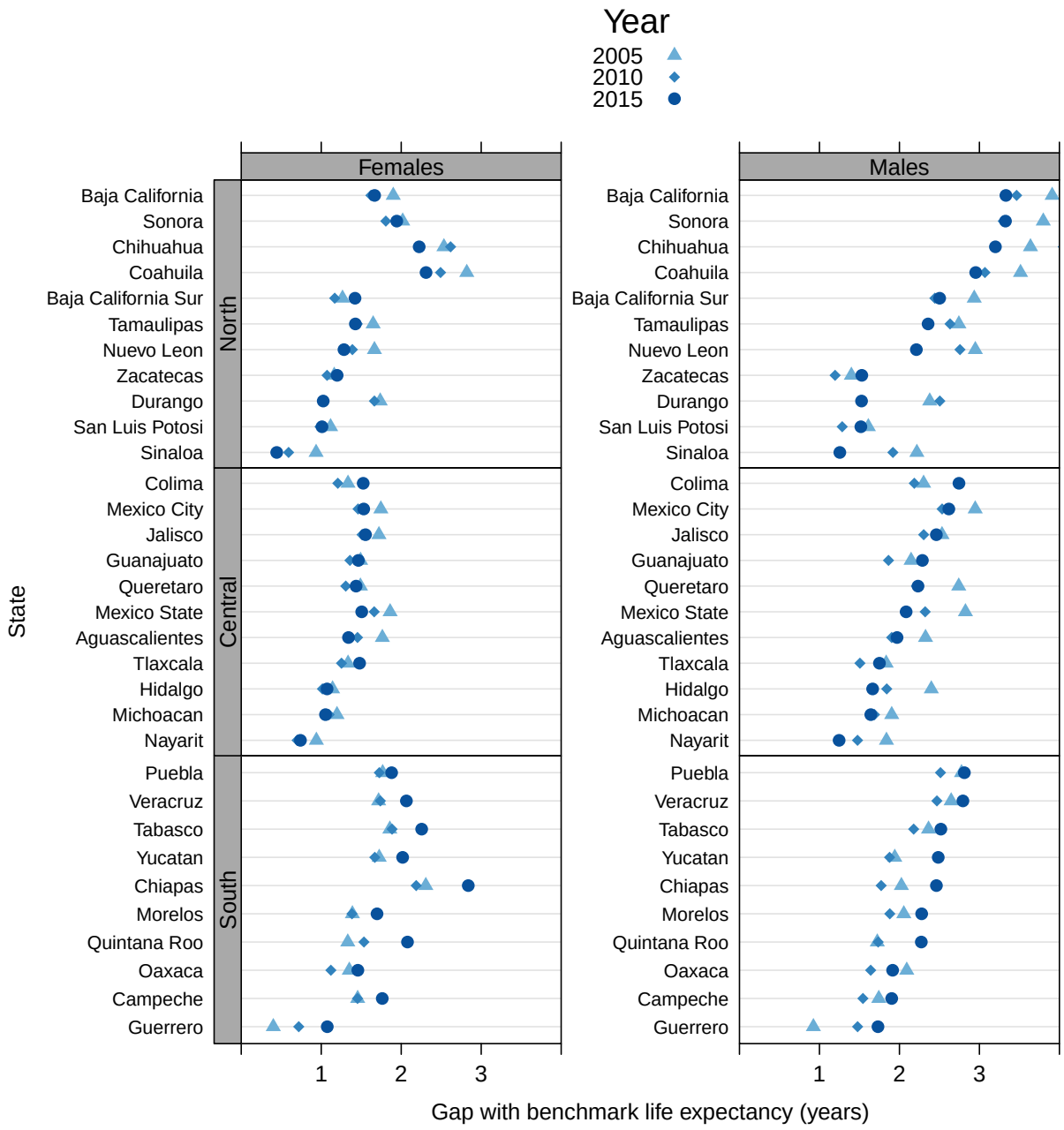


Figure 13: Proportion by cause of death from benchmark mortality for youngest females (ages 0-14). Source: own calculations.

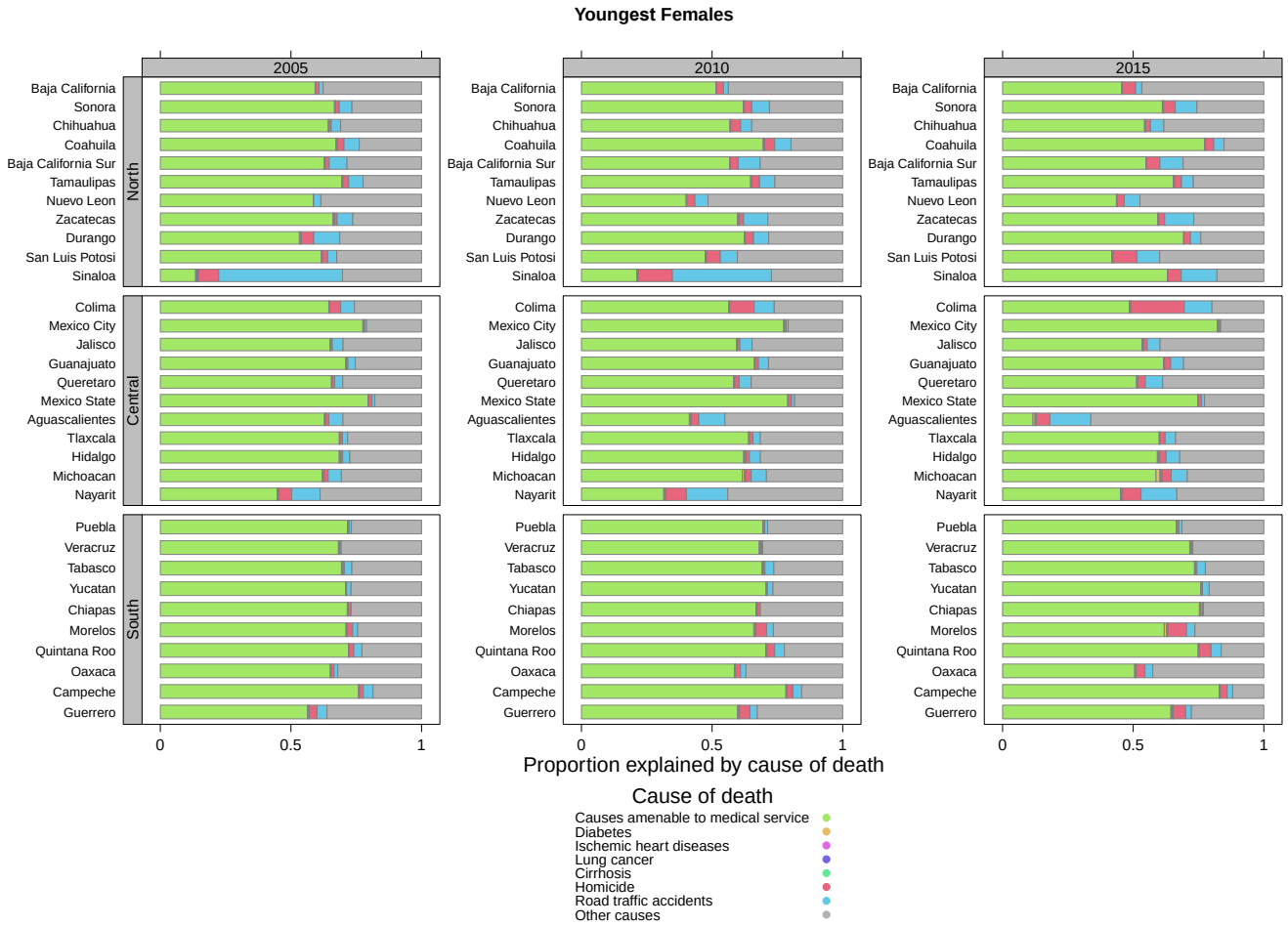


Figure 14: Proportion by cause of death from benchmark mortality for youngest males (ages 0-14). Source: own calculations.

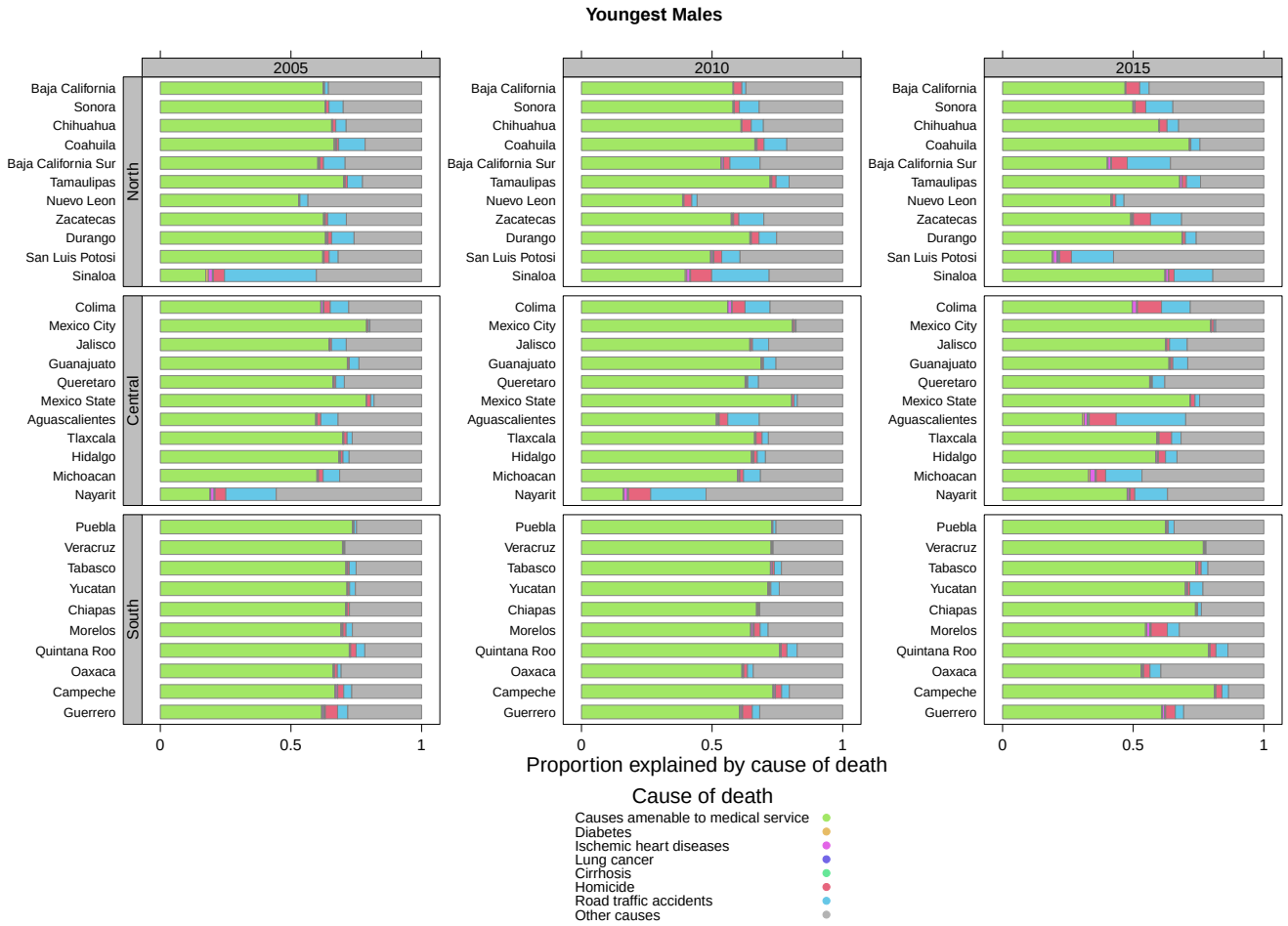


Figure 15: Proportion by cause of death from benchmark mortality for young adult females (ages 15-49). Source: own calculations.

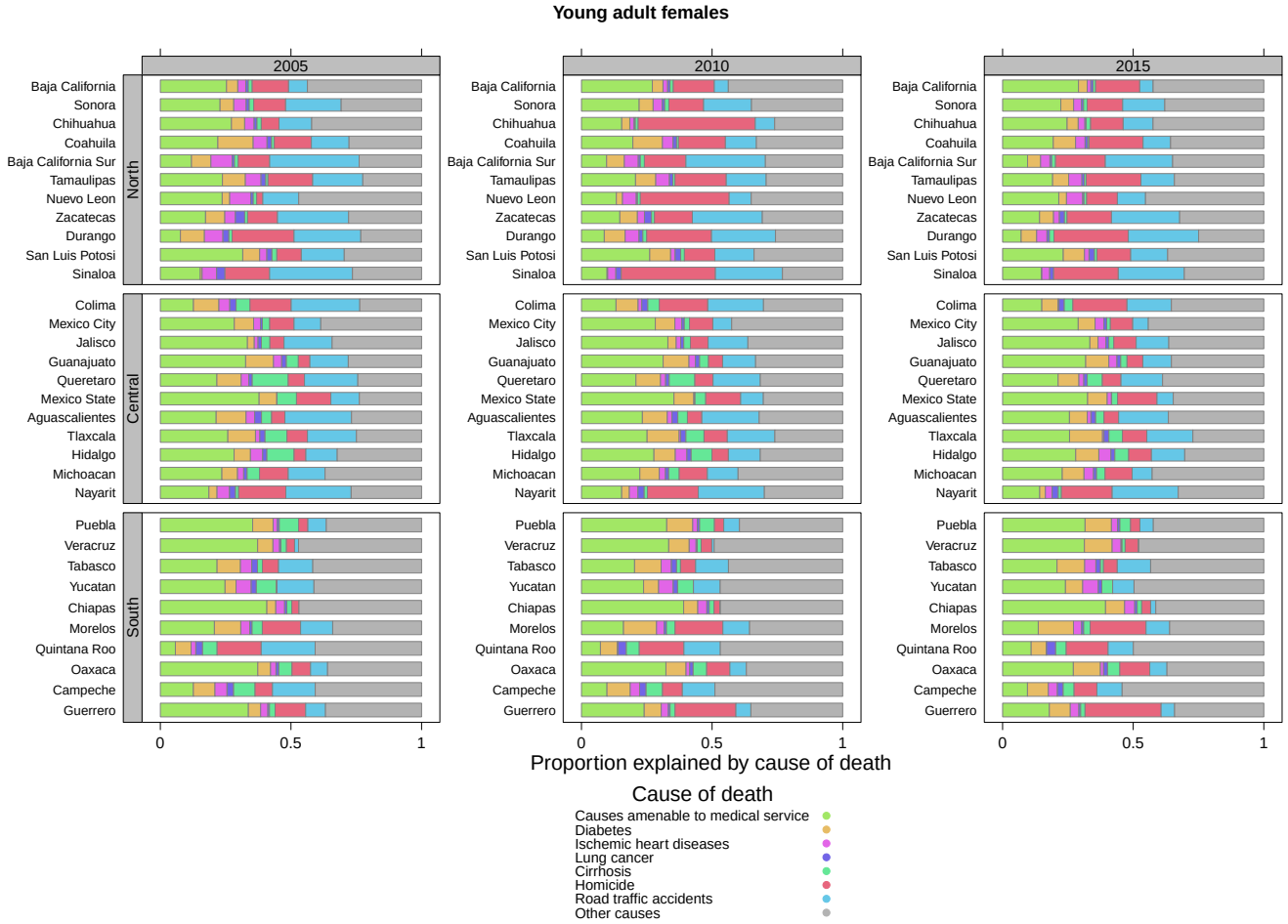


Figure 16: Proportion by cause of death from benchmark mortality for young adult males (ages 15-49). Source: own calculations.

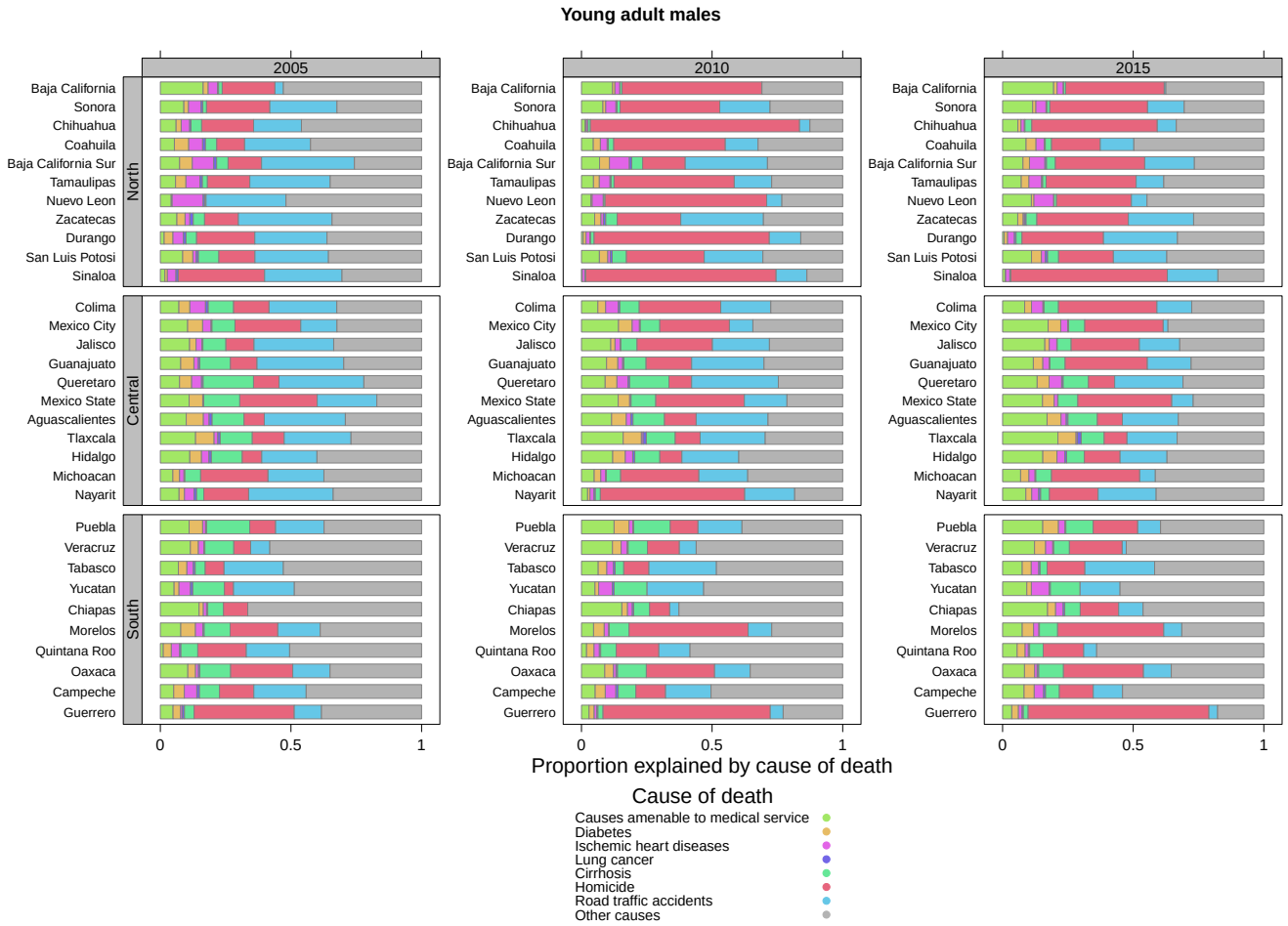


Figure 17: Proportion by cause of death from benchmark mortality for older male adults (ages 50-84). Source: own calculations.

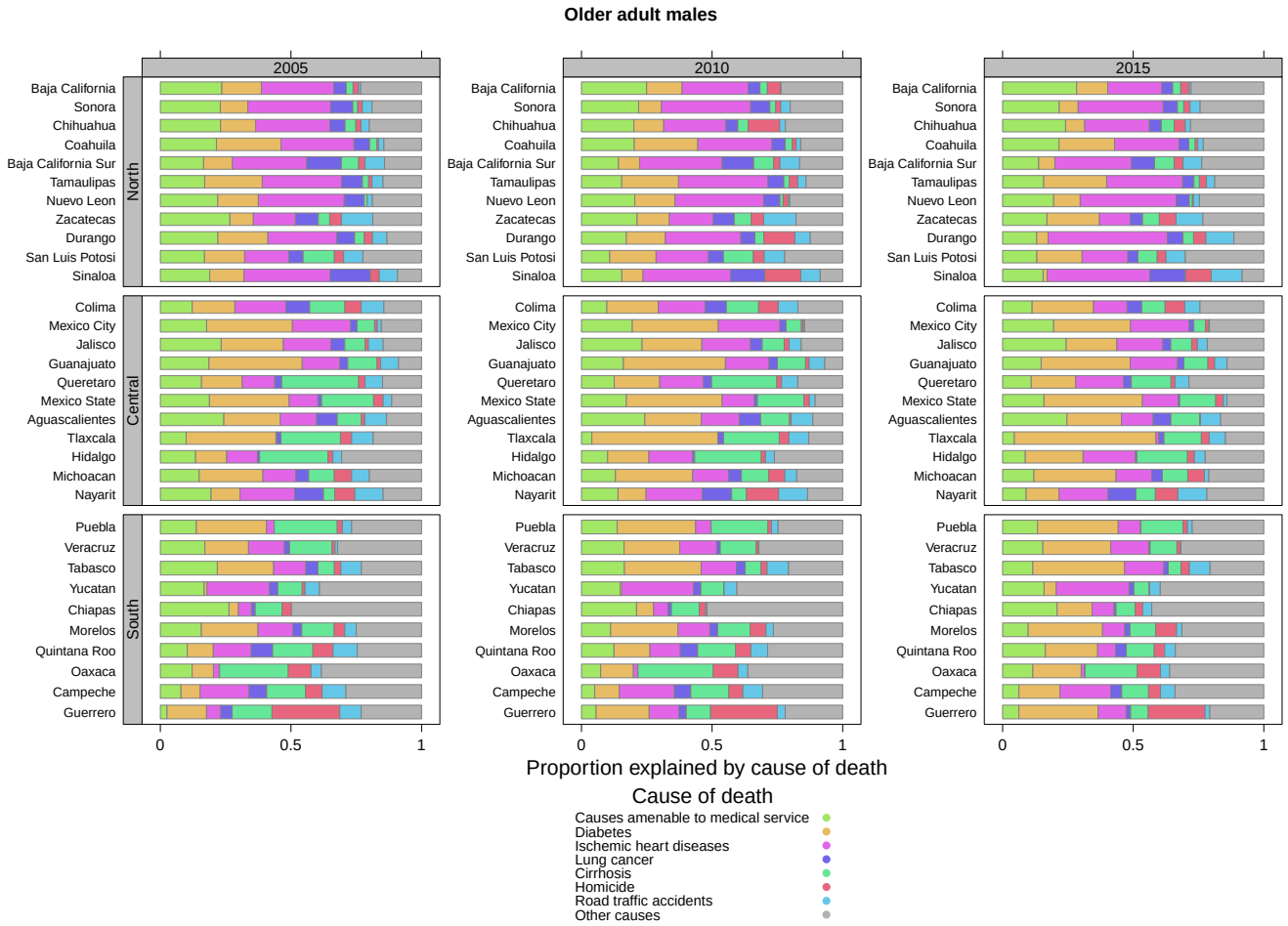


Figure 18: Proportion by cause of death from benchmark mortality for older female adults (ages 50-84). Source: own calculations.