ABOUT MORTALITY DATA FOR CHILE

by Vladimir Canudas-Romo, Rubén Castro, and Dana A. Glei

"Mas que mejorar la suerte del pueblo, el primer paso es conocerlo a fondo y, por desgracia, carecemos de datos estadísticos."
Andrés Bello, 1835
Founder of the University of Chile in 1843[1].

Translation: "More than improving the situation of the [Chilean] people, the first step is to know it in detail; unfortunately, we lack statistical data [for this purpose]."

GENERAL

The collection of official demographic statistics for Chile started with the census of 1835. There was an earlier census in 1813 that has figures regarding the national population, but coverage was incomplete (INE, 2003). The second census attempt started in 1831, but was not finished until 1835 and it triggered the creation of the Office of Statistics (Oficina de Estadística) in 1843 (Kappes, 1993). It was later known as the Central Office of Statistics (Oficina Central de Estadística), General Direction of Statistics (Dirección General de Estadística), Direction of Statistics and Census (Dirección de Estadísticas y Censos), and since 1970, as the *Instituto Nacional de Estatística* (INE). Since its establishment, this institution has been responsible for collecting census and vital statistics data. Its first task was the third official census collection in 1843. After the 1854 census, it was declared by law that censuses would occur at 10 year intervals in 1865, 1875, 1885 and 1895 (INE, 2003). The next census was delayed two years until 1907 because of the devastating 1906 earthquake. Later, Chile conformed with the recommendations of the IVth International Conference of Statistics that censuses would occur at the end of each decade (although that practice was interrupted in 1950): 1920, 1930, 1940, 1952, 1960 and 1970.

The most recent censuses were conducted in 1982, 1992, 2002, 2012, and 2017. However, the 2012 census was flawed by a large undercount. The Director of INE ended up resigning after irregularities in the census were discovered, and he was accused of manipulating the figures (Bonnefoy, 2013). An external review commission was appointed to review the process. They concluded that at least 9.3% of the population was not counted and the undercount exceeded 20% in one-fifth of the municipalities (Bravo et al., 2013). The commission recommended against using the 2012 census for official population estimates (Bravo et al., 2013). Consequently, INE decided to discard the results from that census. Chile held another abbreviated census in 2017.

[1] http://en.wikipedia.org/wiki/Andres_Bello

In Chile, vital statistics data, which complemented the information provided by the censuses, were first published in 1860 with the first edition of the *Statistical Yearbook of the Republic of Chile* (Anuario Estadístico de la República de Chile). This information was published under that title on a regular basis until 1937, and much of the data was also published in smaller collections since 1911, among them *Demography* (Kappes, 1993). This latter publication also had the title *Demography and Social Welfare* (Demografía y Asistencia Social) in some years. In recent years, the title for the Annual Vital Statistics Yearbook has varies somewhat: *Demographic Yearbook* (Anuario de Demografía) in 1997-99; *Vital Statistics Yearly Report* (Estadísticas Vitales Informe Anual) in 2005-11, 2016; *Yearbook of Vital Statistics* (Anuario de Estadísticas Vitales) in 2000-04, 2012-15, 2017-19.

The registration of vital events and the preparation, collection, and publication of these data is currently carried out by three institutions that constitute the System of Vital Statistics (Sistema de Estadísticas Vitales). Those three institutions are the Civil and Identification Register Service (Servicio de Registro Civil e Identificación), the Ministry of Health (Ministerio de Salud), and the INE (INE, 2003).

The mortality series for Chile included in the Human Mortality Database (HMD) covers the period since 1992. This initial series was selected after assessment of the developments in birth, death, and population counts during the second half of the twentieth century. Parts of this evaluation are included in the present document. The main reasons for restricting the HMD series to the period since 1992 are: 1) 1992 was the first census with less than 3% age misreporting; 2) it is only in the last decade of the twentieth century that the percentage of delayed birth registration is 5.4% or lower; and 3) finally, during this period, at least 90% of deaths were certified by a physician. On the page for Chile in the HMD, the section labeled “Input data” includes all of the raw data on population, births and deaths for the second half of the twentieth century that we discuss here.

Source of Data

For the HMD, we use death counts disseminated via the Departemento de Estadísticas e Informatión de Salud (DEIS), Ministerio de Salud, Gobierno de Chile website (http://www.deis.cl/bases-de-datos-defunciones/). For recent years, birth counts were obtained from the INE’s online archives (https://www.ine.cl/estadisticas/sociales/demografia-y-vitales/nacimientos-matrimonios-y-defunciones). Sex-specific annual birth counts prior to 2008 were obtained from annual vital statistic publications. Monthly birth counts prior to 2012 were obtained from the Human Fertility Database, who extracted the original data from annual vital statistics publications or from the data archives maintained by the Ministerio de Salud. The census counts were obtained from published tables (1992) or downloaded from INE’s online archives (2002 & 2017, see Appendix 1 for more details.)

Specific Episodes in Chile’s Demographic History in the second half of the twentieth century

Between the 1950s and 1970s, relative to its overall population, Chile did not experience any large scale wave of immigrants, and net migration was mainly negative but minor. Data from the UN suggests low levels of negative net migration (-0.4% to -0.3%) during 1950-1975, after which net migration increased slowly to near zero in 1990-95 and reached +0.2% during 2010-15 (United Nations, Department of Economic and Social Affairs, Population Division, 2019).

Currently, the largest number of immigrants comes from neighboring countries. Among these migrants, INE (2005) estimated that a large proportion later returned to their country of origin. INE estimated that 857,781 Chileans were living abroad in 2005, 50.1% of whom were in Argentina, 13.3% in the United States and 4.9% in Sweden (INE, 2005). The report *Chileans Living Abroad* (INE, 2005) notes that economic and family reasons were the main impetus for the emigration. The period of 1970-75 was an exception; political turmoil within Chile caused an increase in political emigration as well as an increase in the number of deaths.

TERRITORIAL COVERAGE

During the period covered by the HMD, the national territory of Chile is bordered by Peru to the north, Bolivia and Argentina to the east, the South Pole, and the Pacific Ocean to the west (INE, 2003). This also includes Easter Island (Isla de Pascua) and Isla Sala y Gomez. The region of Tacna, which belonged to Chile from 1880 until 1929, is not included in the HMD mortality series.

DEATH COUNT DATA

Coverage and Completeness

Death data cover the *de facto* population. In the second half of the twentieth century, the collection of deaths is of good quality (INE-CEPAL, 2004), and after World War II, the first evidence of mortality decline in Chile was observed in the period 1965 to 1970, together with a strong decline in fertility. This reduction in mortality was interrupted during the years of political turmoil, but after 1975 the declining trend continued. By 1975, infant mortality had reached very low levels comparable to those in developed nations (INE, 1999; INE-CEPAL, 2004). Medical certification of deaths is required by law in Chile; in the 1980s, over 90% of deaths were certified by physicians, and by 2003 this figure had reached 99%. Finally, as another measure of the quality of death registration system, ill-defined conditions were indicated as the cause of death for only 3% of registered deaths in 2003 (Núñez and Icaza, 2006).

As reported to the United Nations Statistical Division (2017) by the Chilean National Statistics Office, completeness of death registration for Chile was 90% or greater in 2012. The Global Burden of Diseases (GBD) study (Wang et al., 2017, see Figure 1) estimated that completeness of death registration in Chile was 95% or higher during 1990-2014. The Latin American Mortality Database (LAMBdA) Team estimated that relative completeness (i.e., the completeness of death registration relative to population counts) was 96% for the intercensal interval 1952-60, but improved to 98% for the period centered at 2006 based on the census in 2002 (Beltrán-Sánchez et al., 2019, see Table 3.4).

Specific Details

Individual death records for 1990-2020 were downloaded from DEIS and aggregated to obtain death counts by sex, single year age, and calendar year.

POPULATION COUNT DATA

Coverage and Completeness

All Chilean censuses represent the *de facto* population. The country has a long history of censuses, but data quality has varied over time (Goyer and Draaijer, 1983). INE calculated that the Census of 1940 was underenumerated by 4% and published only adjusted results with no documentation for the adjustment method. Table 1 presents an indicator of age heaping on any terminal digit (i.e., Myer's Index) for the subsequent five censuses. Myer's Index ranges from 0 to 90, where 0 indicates no age heaping.

Whipple's Index shows the excess or deficit of people at ages ending in 0 or 5. When this index is applied to Chilean data it suggests that the 1960 Census was of high quality (Goyer and Draaijer, 1983), yet Myer's Index indicates that age is reported incorrectly for more than 10% of the population (Table 1). The 1970 census showed little improvement in Myer's index and worsening of Whipple's Index. During the last three decades of the twentieth century, data quality improved substantially.

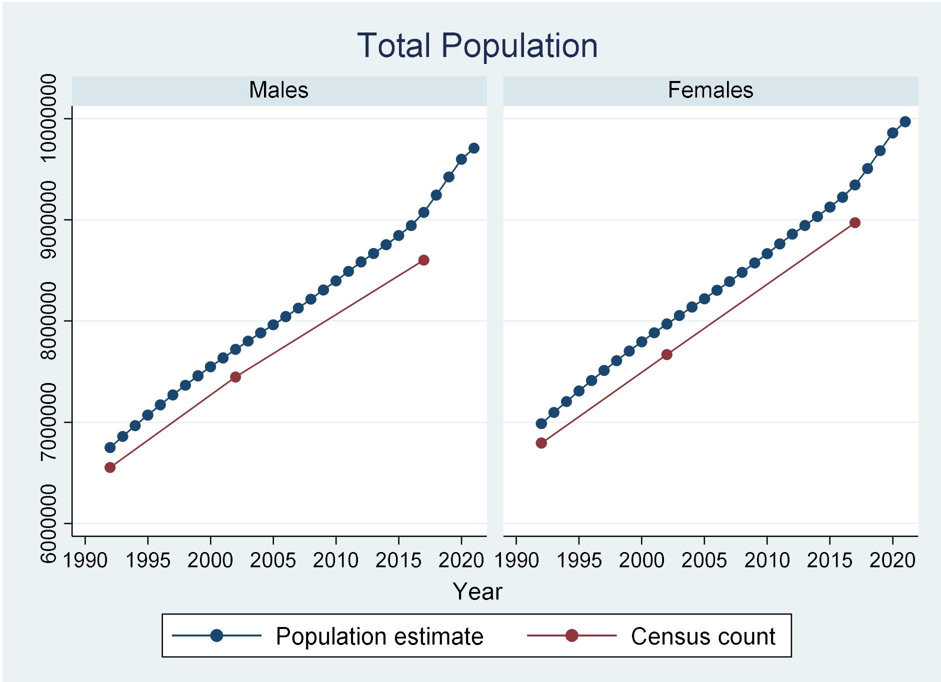
Table 1. Myer's Index for the Chilean censuses from 1952 to 2002.

CENSUS	Total	Males	Females
1952	15.3	12.9	17.6
1960	12.9	11.0	14.6
1970	10.3	9.4	11.2
1982	4.0	3.3	4.7
1992	2.6	2.4	2.9
2002	2.5	2.5	2.6

Source: INE-CEPAL. 2004

In Figure 1, we plotted the total population based on the 1992, 2002, and 2017 censuses against the official population estimates. The latter are higher than the former; the biggest differential is for men in 2017, where the official population estimate as of June 30, 2017 is 5.5% higher than the April 19, 2017 census count. The total census count in 2017 is roughly on par with the official population estimate five years earlier.

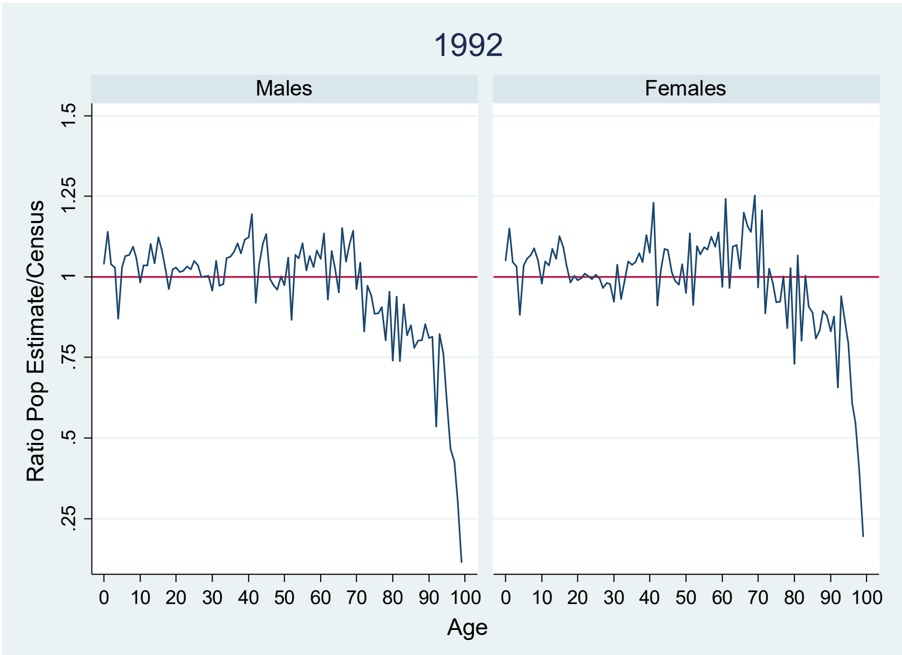
Figure 1. Total population of Chile by sex, Census vs. Official Population, 1992-2021



When we examined the ratio of population estimates to census counts by age, we found that the biggest relative discrepancies were above age 80 in 1992 (Figure 2) and 2002 (Figure 3) and at ages 100 and older in 2017 (Figure 4). However, at those oldest ages, the official population estimates are much *lower* than the census counts, perhaps because of age exaggeration in the census.

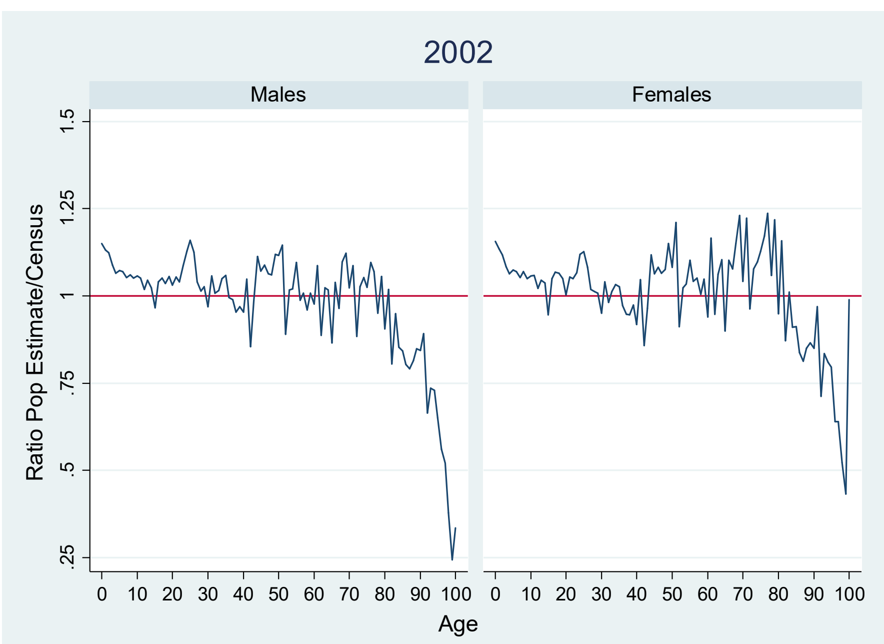
The age structure of adjustment appears to differ across the three censuses. In 1992, the official population estimates above age 70 appear to have been adjusted downwards compared with the census counts.

Figure 2. Ratio of Official Population to Census Counts by age and sex, 1992



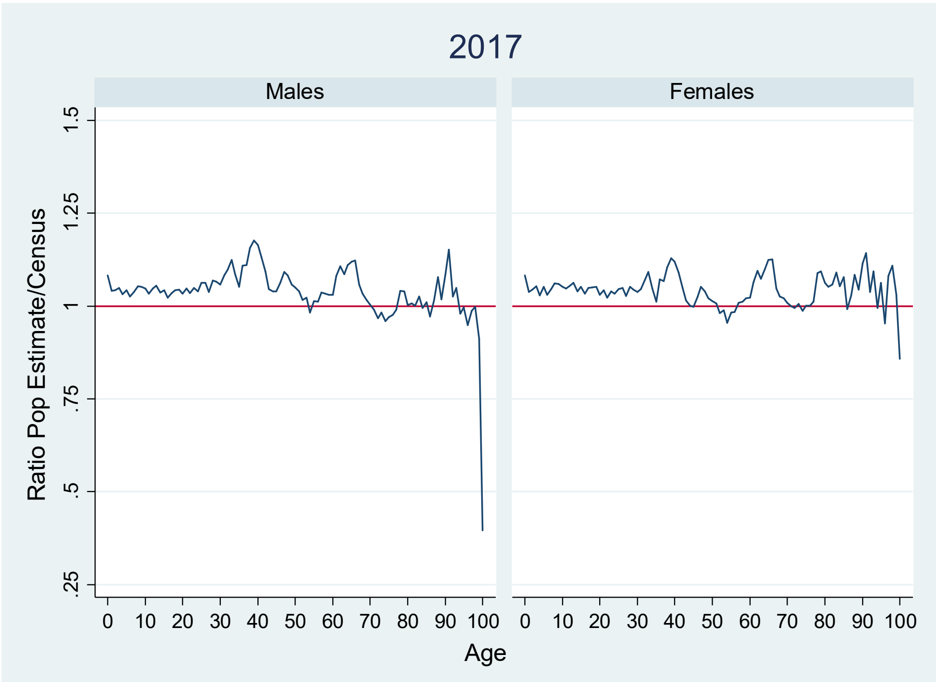
In 2002 (Figure 3), the official population estimates were adjusted downwards compared with the census counts only above age 80.

Figure 3. Ratio of Official Population to Census Counts by age and sex, 2002



By 2017 (Figure 4), the downward adjustment compared with the census counts was only above age 100.

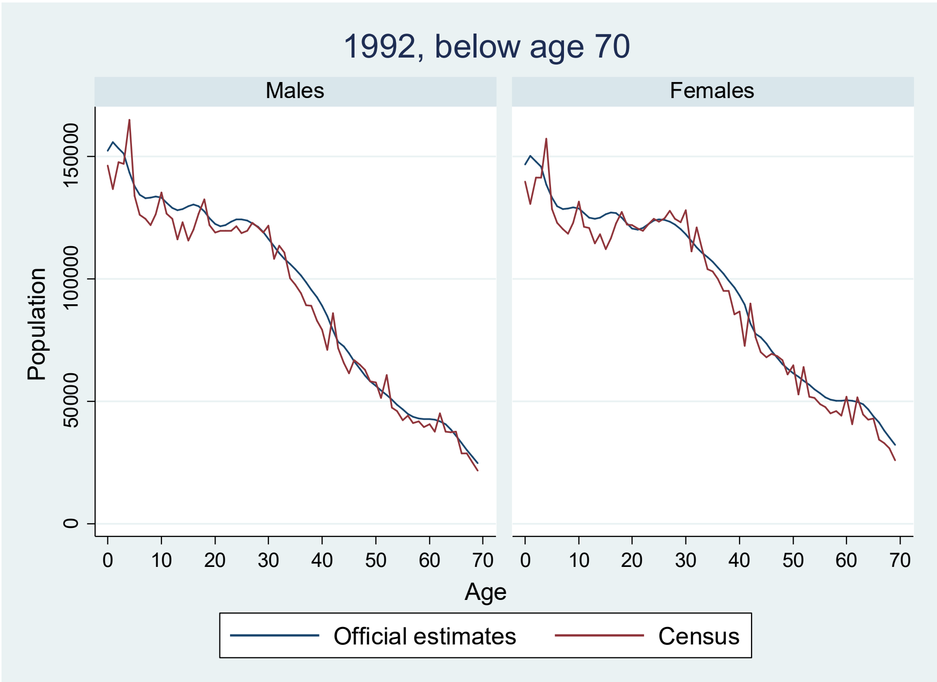
Figure 4. Ratio of Official Population to Census Counts by age and sex, 2017



At younger ages, there does not appear to be a consistent census undercount below age 60 in 1992 (Figure 2). Yet, the discrepancies between the (adjusted) population estimates and census counts in 2002 suggest a notable undercount at young ages (Figure 3). By 2017, there appears to be a consistent undercount at most ages below 70 (Figure 3). Although the 1992 and 2002 censuses show evidence of age heaping, the 2017 census appears less affected by age heaping. Altogether, these results suggest that the quality of the census may have improved over time. The problems at working ages may reflect the inability of the statistical system to accurately reflect processes related to internal and international migration.

When we plot the official population estimates against the census counts below age 70 for 1992 (Figure 5), we can see that the former are generally higher than the latter except at age 5 and ages ending in 10, suggesting age heaping in the census.

Figure 5. Official Population vs. Census Counts by age (<70) and sex, 1992



As we understand it from the documentation (INE, 2018), INE begins with the population in 1992 and then used annual data on fertility, mortality, and migration by sex and age to recursively derive the population estimates for each year. However, it is unclear to us how the estimates for the 1992 population were derived. The documentation indicates that the 1992 population was based on CELADE's calculations using data beginning in 1950, along with old projections.

If the official population estimates are closer to the true population than the census counts but death counts are under-registered, then estimates of life expectancy using unadjusted death counts in the numerator with official population estimates in the denominator will be upwardly biased (i.e., mortality rates will be under-estimated). Therefore, we use the census counts (rather than the official population estimates) and produce our own intercensal estimates using the HMD methods protocol. The resulting HMD estimates of life expectancy are generally similar to those published by INE (2000, 2016) and the UN (United Nations, Department of Economic and Social Affairs, Population Division, 2019).

Although using census counts is probably the best possible alternative, there are several disadvantages:

1) We may not be able to extend the Chilean mortality series for more than a few years, after which we will have to wait for the next census.

2) The population at working ages may be underestimated, but it is unlikely to have a substantial influence on mortality.
3) The last intercensal period is unusually long (15 years), which may negatively affect the quality of intercensal population estimates.
4) Data by single year of age should be used with caution.

BIRTH COUNT DATA

Coverage and Completeness

In general, the data are considered to be of good quality, although there are some problems. As reported to the United Nations Statistical Division (2017) by the Chilean National Statistics Office, completeness of birth registration for Chile was 90% or greater in 2012.

Statistics on births have been a concern for INE, not because of unregistered births, but because of delayed registration. INE has elaborated a system called "*inscripciones tardias*" to fix this problem, by updating official counts with births registered up to seven years after the birth (INE, 2004). The percentage of births with delayed registration declined from 5.1% in 1992 to 0.7% in 2006 to 0.3% in 2010 (INE, 2015, 2019). It is thought that many infant deaths occurring before a birth certificate is issued are registered as fetal deaths (INE-CEPAL, 2004).

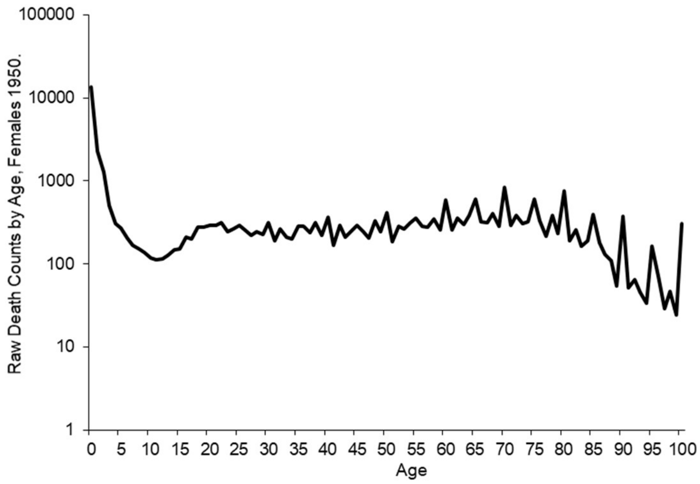
DATA QUALITY ISSUES

These data should be used with caution because of data quality issues (e.g., age heaping in the census counts, possible under-estimation of old-age mortality, census undercounts at younger and working ages).

Age Heaping

- Prior to 1990, the raw death counts exhibited patterns of age heaping at ages 40, 50, …, 90 (see Figure 6). By 1990, the age heaping had largely disappeared.
- The census counts prior to 1992 showed considerable age heaping at ages 30, 40, …, 80 (see Figure 7). By the 1992 census, age heaping was greatly attenuated.
- Correspondingly, the death rates prior to 1990 show notable age heaping at older ages (see Figure 8), which is one of the reasons why we restricted the mortality series for Chile to the period since 1992 (see "GENERAL" section above for more details).
- As noted above, there is still some age heaping in the 1992 and 2002 census counts.

Figure 6. Raw Death Counts by Age. Females, 1950 and 1990



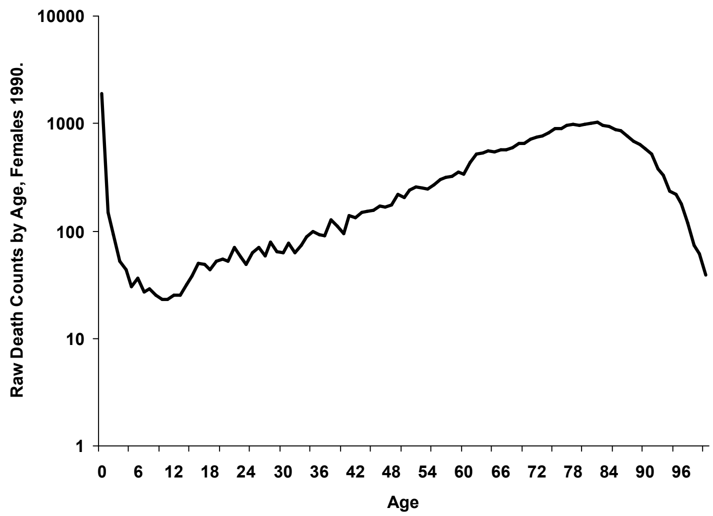


Figure 7. Raw Census Counts by Age. Females, 1952 and 1992

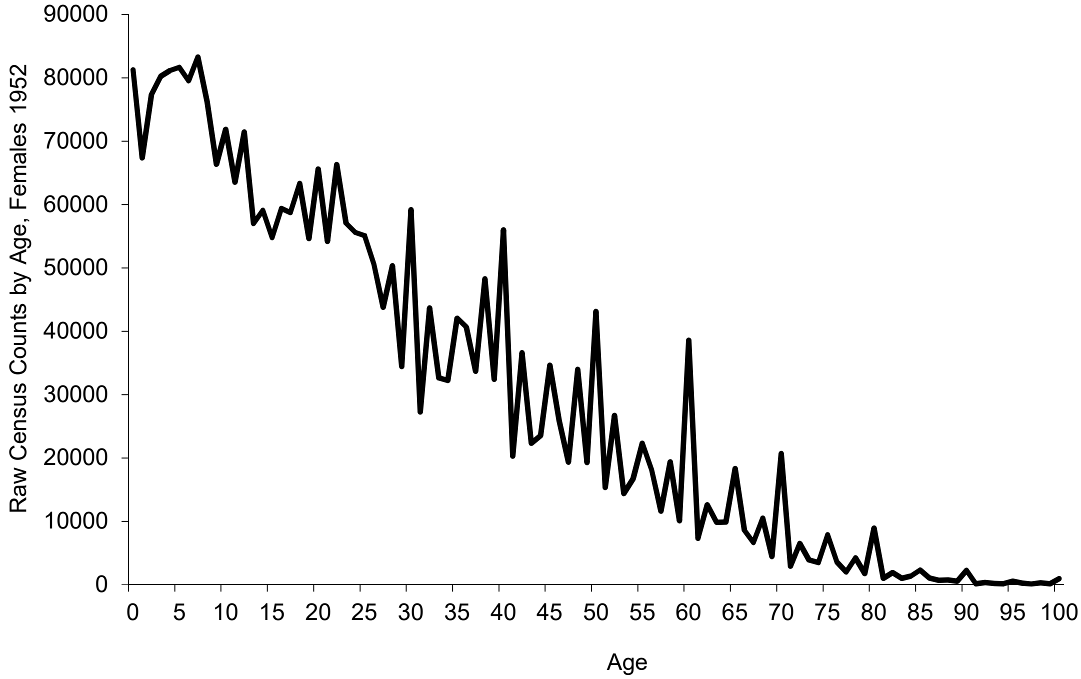
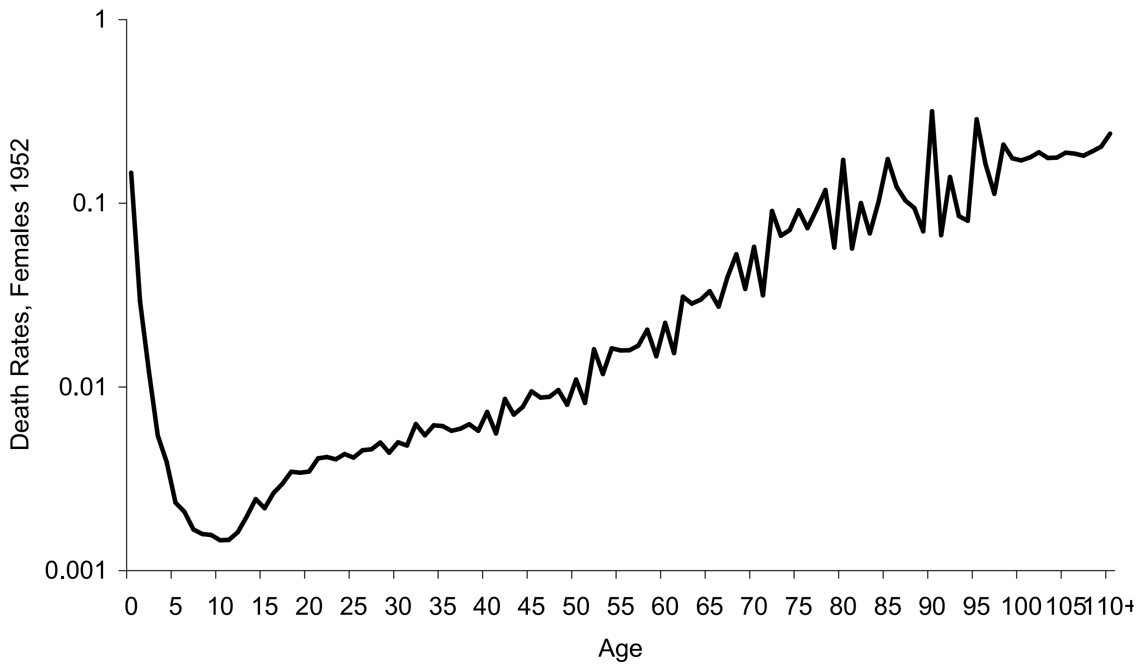
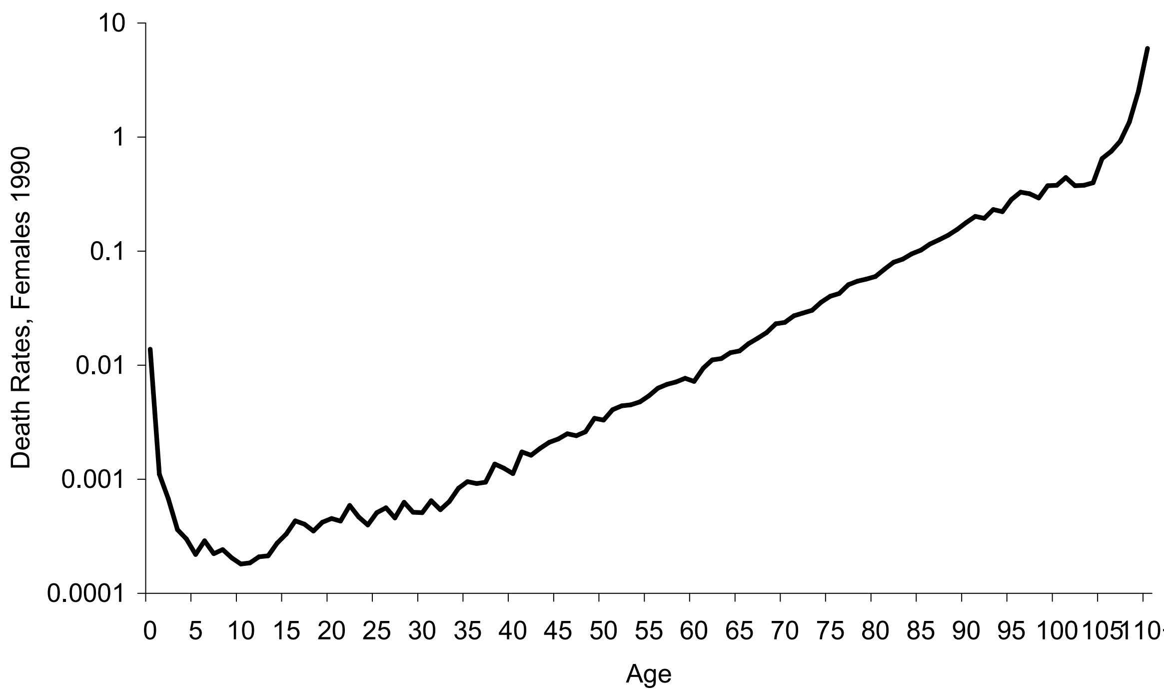


Figure 8. Estimated Death Rates by Age, Females, 1952 and 1990.





Possible under-estimation of old-age mortality

As noted above, comparison of the census counts with the (adjusted) official population estimates suggest that the census overestimated the population at the oldest ages (see Figures 2-4). However, above age 80 we recalculate population estimates using the extinct cohort or survivor ratio method, which avoids some of these problems of apparent age exaggeration in the census.

If we had used the official population estimates rather than the census counts, our estimates of e_{80} for the period 1992-2002 would have been similar (e.g., 8.7 years in 2002 using the official population estimates versus 8.6 years using the census counts), but the estimates of e_{80} after 2002 would have been even higher. For example, the estimate for e_{80} in 2017 (among both sexes combined) was 8.8 years; if we had used the official population estimates, the corresponding estimate would have been 9.9 years. There is a similar differential in the estimates of e_0 (79.8 in 2017 when using the census counts versus 80.8 when using the official population estimates). Thus, we conclude that the differences are driven primarily by younger ages (i.e., in 2017, the official population estimates at younger ages were higher than the census counts; because the denominators are bigger for the former than the latter, they yield lower mortality rates and higher estimates of life expectancy).

It is still possible that we are underestimating mortality at older ages, but the problem would have been much worse if we had used the (adjusted) official population estimates in place of the census counts.

Census undercounts at younger and working ages

As noted above, there is evidence that the 2002 census may have undercounted the population at young ages, especially below age 20 (see Figure 3) and that the 2017 census undercounted the population at most ages below 70 (see Figure 4). Consequently, it is possible that we have overestimated the mortality rates at younger ages (because the denominators are too small).

REVISION NOTES

Changes with the December 2017 revision:

Life tables: All life tables have been recalculated using a modified methods protocol. The revised protocol (Version 6) includes two changes: 1) a more precise way to calculate a0, the mean age at death for children dying during the first year of life and 2) the use of birth-by-month data (where and when available) to more accurately estimate population exposures. These changes have been implemented simultaneously for ALL HMD series/countries. For more details about these changes, see the revised Methods Protocol (at http://v6.mortality.org/Public/Docs/MethodsProtocol.pdf), particularly section 7.1 on Period life tables and section 6 and Appendix E, on death rates. The life tables calculated under the prior methods (Version 5) remain available at v5.mortality.org but will not be further updated in the future.

Changes with the October 2020 revision:

Raw Data: We added death and birth counts for 2008-2017. Death counts for 1992-2007 were updated (deaths since 2002 are now available by Lexis triangle; all death counts are available to the maximum age attained; there is no longer an open age interval). We added the 2017 census counts and are no longer using the official population estimates. Thus, we revised all previous population estimates.

Changes with the April 2022 revision:

Raw Data: We added death and birth counts for 2018-2020 and replaced the death counts for 2016-17 with the most up-to-date counts. The vital statistics for 2020 remain provisional. Furthermore, we aggregated all death counts for 1990-2020 into 1x1 format (i.e., by calendar year and single year of age to 100+). The death records currently available from DEIS (for 2016-20) do not include year of birth; thus, we cannot derive deaths by Lexis triangle. We could continue to use deaths by Lexis triangle for 2002-15 that were downloaded from DEIS in 2020 (when the dataset still included the year of birth), but there is some uncertainty in the the tabulations by Lexis triangle (i.e., there are many deaths for which the year of birth was missing or there were inconsistencies between reported age, date of birth, and date of death). Therefore, we decided to simply aggregate all the death counts into 1x1 format, which has little impact on the period estimates. For example, when we compared the results using 1x1 deaths counts for all years versus the corresponding estimates if we retain deaths by Lexis triangle for 2002-15, the estimates for life expectancy were nearly identical. The biggest discrepancy in e_0 was for women in 2000: 79.928 (using 1x1 deaths for all years) vs. 79.933 (using deaths by Lexis triangles for 2002-15)—a difference of 0.006 years (or <0.1%). In the case of e_{80}, the largest discrepancy was for men in 2004: 7.343 vs. 7.352, respectively (a difference of 0.009 years or 0.1%).

ACKNOWLEDGEMENTS

We thank Miguel Ojeda Labourdette at INE for providing information regarding the data for Chile. We would like to thank Angela Chau and Lisa Yang for their hard work devoted to data search and entry of the Chilean data.

REFERENCES

Beltrán-Sánchez, H., Palloni, A., Pinto, G., Verhulst, A., 2019. The Latin American Mortality Database (LAMBdA): Methodological Document, Version II, January 2019.

Bonnefoy, Pascale. (2013). Chilean President Apologizes for Census. *The New York Times*. Accessed June 8, 2020 (https://www.nytimes.com/2013/08/10/world/americas/chilean-president-apologizes-for-census.html).

Bravo, D., Larrañaga, O., Millán, I., Ruiz, M., Zamorano, F. (2013). Informe final: Comisión externa revisora del censo 2012. Accessed June 8, 2020 (https://es.slideshare.net/nacioncl/informefinal-ine).

Goyer, D.S., Draaijer, G.E. (1983). *The Handbook of National Population Census: Latin America and the Caribbean*. London: Greenwood Press.

Instituto Nacional de Estadísticas, INE. (1999). Demografía [Demography]. *Enfoques Estadísticos 1*.

Instituto Nacional de Estadísticas, INE. (2000). *Anuario de Estadistiscas Vitales, 2000.*

Instituto Nacional de Estadísticas, INE. (2003). *Anuario de Estadísticas Vitales 2001*.

Instituto Nacional de Estadísticas, INE. (2004). *CHILE: Tablas Abreviadas de Mortalidad por Sexo Total País y Regiones 2001-2002* [Abridged life tables by sex for the country and its regions 2001-2002].

Instituto Nacional de Estadísticas, INE. (2005). Regístro de Chilenos en el Exterior – Resultado Final [Chileans living abroad—final results]. *Enfoques Estadísticos 28*.

Instituto Nacional de Estadísticas, INE. (2015). Estadísticas Vitales, Anuario 2013. Anexos Resultados para región de acuerdo al método de inscripciones tardías de los nacimientos, País, Nacidos vivos, defunciones generales, matrimonios, defunciones de menores de un año, menores de 28 días y fetales, 1973-2013. Santiago: Instituto Nacional de Estadísticas. Accessed February 10, 2020 (http://www.ine.cl/docs/default-source/nacimientos-matrimonios-y-defunciones/cuadros-estadisticos/2013/ine_anuario-de-estad%C3%ADsticas-vitales_2013_tabulados.xlsx?sfvrsn=7028c915_5

Instituto Nacional de Estadísticas, INE. (2016). *Chile: Tabla de Vida per Método de Mortalidad óptima*. Santiago: INE.

Instituto Nacional de Estadísticas, INE. (2019). Anuario de Estadísticas Vitales, 2017. Anexo B, Tabulado 1.2.2-01 Nacidos vivos, ocurridos e inscritos / corregidos. Santiago: Instituto Nacional de Estadísticas. Accessed January 27, 2020 (http://www.ine.cl/docs/default-source/nacimientos-matrimonios-y-defunciones/cuadros-estadisticos/2017/anuario-de-estad%C3%ADsticas-vitales-2017-tabulados.xlsx?sfvrsn=b9dfaa14_6).

Instituto Nacional de Estadísticas, INE. (2018). *Estimaciones y proyecciones de la población de Chile 1992-2025, Total País: Methodología y principales resultados*. Accessed June 1, 2020 (http://www.ine.cl/docs/default-source/proyecciones-de-poblacion/metodologia/proyecci%C3%B3n-base-2017/ine_estimaciones-y-proyecciones-de-poblaci%C3%B3n-1992-2050_base-2017_metodolog%C3%ADa.pdf?sfvrsn=2e61d4ae_6).

Instituto Nacional de Estadísticas y la Comisión Económica para América Latina y el Caribe, INE-CEPAL. (2004). *CHILE: Proyecciones y Estimaciones de Población. Total País 1950-2050.*

Kappes, Hector. (1993). 150 Aniversario del Instituto Nacional de Estadísticas Algunos Hitos Significativos [150th Anniversary of the INE some key historical moments]. *Estadistica & Economia 6*. Instituto Nacional de Estadísticas.

Núñez, M Loreto and M Gloria Icaza. (2006). "Quality of Mortality statistics in Chile, 1997-2003." *Rev Méd Chile*; 134: 1191-1196.

United Nations, Department of Economic and Social Affairs, Population Division, 2019. World Population Prospects 2019, Online Edition. Rev. 1.

United Nations Statistics Division, 2017. Coverage of civil registration system, births and deaths [electronic resource]. Accessed June 20, 2018 (https://unstats.un.org/unsd/demographic-social/crvs/).

Wang, H., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abera, S.F., Abraha, H.N., Abu-Raddad, L.J., Abu-Rmeileh, N.M., 2017. Global, regional, and national under-5 mortality, adult mortality, age-specific mortality, and life expectancy, 1970–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet 390, 1084–1150.

APPENDIX 1:

DESCRIPTION OF ORIGINAL DATA USED FOR HMD CALCULATIONS

DEATHS

Period	Type of Data	Age Grouping	RefCode(s)†
1992-2015	Annual number of deaths (*de facto* population) by sex and single year of age (1x1)	0,1,...,max, unk	19
2016-2019	Annual number of deaths (*de facto* population) by sex and single year of age (1x1)	0,1,...,max, unk	70
2020	**Provisional** annual number of deaths (*de facto* population) by sex and single year of age (1x1)[a]	0,1,...,max, unk	70

† The reference code is used in the raw data files (Input Database) to link data with sources.
unk = deaths of unknown age
[a] The death counts for 2020 remain provisional. Provisional death counts for 2020 [*Cifras provisionales 2020*] were published in February 2022. The raw death counts used for the HMD (which were downloaded from DEIS on March 14, 2022, RefCode=70) were only slightly higher than the provisional counts published in February 2022.

POPULATION

Period	Type of Data	Age Grouping	RefCode(s)†
1992	Census counts (*de facto* population) as of April 22th, by sex and single year of age to 99+.	0, 1, …., 99+	25
2002	Census counts (*de facto*) as of April 24th, by sex and single year of age to 108+.	0, 1, …., 107, 108+	26
2017	Census counts (*de facto*) as of April 19th, by sex and single year of age to 100+.	0, 1, …., 107, 100+	27

† The reference code is used in the raw data files (Input Database) to link data with sources.
unk=population of unknown age

BIRTHS BY SEX

Period	Type of Data	RefCode(s)†
1907-2019	Live birth counts for the *de facto* population by sex and calendar year	1-9, 60
2020	**Provisional** live birth counts for the *de facto* population by sex	61

† The reference code is used in the raw data files (Input Database) to link data with sources.

BIRTHS BY MONTH

Period	Type of Data	RefCode(s)†
1947-2019[a]	Live birth counts for the *de facto* population by month and calendar year	32-37

† The reference code is used in the raw data files (Input Database) to link data with sources.
[a] The provisional data for 2020 do not include birth counts by month.

APPENDIX 2:

ADDITIONAL DATA INCLUDED IN THE INPUT DATA

DEATHS

Period	Type of Data	Age Grouping	RefCode(s)†
1943-1953	Annual number of deaths (*de facto* population) by sex and single year of age up to age 99 and open age interval 100+ (1x1)	0,1,...,100+, unk	10, 11, 12
1954	Annual number of deaths (*de facto* population) by sex and single year of age up to age 104 and open age interval 105+ (1x1)	0,1,...,105+, unk	12
1955	Annual number of deaths (*de facto* population) by sex and 5-year age groups (5x1)	0-4,5-9,...,95-99, 100+, unk	13
1956-1961	Annual number of deaths (*de facto* population) by sex and single year of age up to age 104 and open age interval 105+ (1x1)	0,1,...,105+, unk	14
1962	Annual number of deaths (*de facto* population) by sex and 5-year age groups (5x1)	0-4, 5-9,...,95-99, 100+, unk	15
1963-1989	Annual number of deaths (*de facto* population) by sex and single year of age up to age 104 and open age interval 105+ (1x1)	0,1,...,105+, unk	16, 17, 18
1990-1991	Annual number of deaths (*de facto* population) by sex and single year of age (1x1)	0,1,...,max	19

† The reference code is used in the raw data files (Input Database) to link data with sources.
unk=deaths of unknown age

POPULATION

Period	Type of Data	Age Grouping	RefCode(s)†
1940	Census counts (*de facto* population) as of November 28th, by sex and single year of age to 101.	0, 1, …, 100, 101+	20
1952	Census counts (*de facto* population) as of April 24th, by sex and single year of age to 100.	0, 1, …., 99, 100+, unk	21
1960	Census counts (*de facto* population) as of November 29th, by sex and single year of age to 100.	0, 1, …., 99, 100+	22
1970	Census counts (*de facto* population) as of April 22th, by sex and single year of age to 85.	0, 1, …., 84, 85+	23
1982	Census counts (*de facto* population) as of April 21th, by sex and single year of age to 99.	0, 1, …., 99+	24
1992-2021	Official population estimates as of June 30th, by sex and single year of age to 100+.	0, 1, …., 99, 100+	50

† The reference code is used in the raw data files (Input Database) to link data with sources.