Healthy Aging: A 22-Year Age Distribution Comparative Analysis Between the California Teachers Study Cohort and the General California Adult Female Population, 2000 to 2022

Michael Royce Tan, BSN, RN, MPH Candidate

University of Michigan—Ann Arbor
School of Public Health

tmroyce@umich.edu

April 23, 2025

In collaboration with California Teachers Study Team, special thanks for their guidance and support.

Abstract

Background: The California Teachers Study (CTS), established in 1995, follows female teachers across California, provides a unique opportunity to examine demographic patterns that may reveal occupational influences on longevity and healthy aging.

Objective: This study investigated whether CTS participants demonstrate different age distribution patterns compared to the general California female population over time, and what these differences might suggest about potential longevity factors

Methods: We conducted an ecological comparison analyzing CTS participant data (n=125,119) alongside California census data for adult females from 2000-2022. Participants were categorized into age groups, excluding groups with fewer than 100 individuals. Age distributions were assessed through frequency analyses, percentage differences, and visualization techniques comparing the cohorts across multiple timepoints.

Results: The CTS cohort exhibited a progressively older age distribution compared to the general California female population throughout the study period. While younger age groups (25-39 years) decreased as expected, older brackets (65+ years) showed substantial growth beyond the general population, particularly among those 75 and older. By 2022, the 75-79 age group showed a 9.3% higher representation in CTS compared to the general population, with the 85+ group demonstrating an 8.5% positive difference (up from 0.6% in 2000).

Conclusion: The observed aging patterns in the CTS cohort suggest potential longevity advantages. These findings warrant further investigation into socioeconomic, educational, behavioral, and occupational factors that may contribute to healthy aging in this professional population.

Keywords:

1 Background

The pursuit of not just a longer, but a healthier, more fulfilling life has become increasingly important as global demographics shift toward an older population.

1.1 Healthy Aging and Longevity

Populations worldwide continue to age rapidly, the number of individuals over 60 are projected to double by 2050, while those over 80 are expected to triple.[1] This shift signals the growing importance of understanding and promoting both healthy aging and longevity. While conceptually distinct, healthy aging and longevity are interwoven in ways that deeply affect both personal wellness and society overall.[2]

Healthy aging represents a fundamental shift in how we understand wellbeing across the lifespan. Rather than merely preventing disease, it encompasses the natural, proactive, and continuous approach to wellness at every age.[2;3] It's the ongoing improvement of physical health, mental health, social connections, and independence.[2;3] Rather than focusing solely on the absence of illness, healthy aging emphasizes active engagement in behaviors and environments that foster resilience, long-term wellbeing, and life fulfillment.[1;2;3;4] More importantly, healthy aging isn't something we begin in our later years, it's a foundation we can establish at any age, with habits cultivated early becoming the roots that support our wellbeing throughout life's journey.[4]

Longevity, on the other hand, represents our capacity to extend life beyond average expectations.[5] Lifespan refers to the maximum possible years one could theoretically live, whereas life expectancy captures the average years someone is likely to live based on mortality patterns.[5] Yet extending life alone isn't the complete picture, this is where healthspan emerges as the vital counterpart, defined as the portion of life spent in good health, free from chronic diseases and disabilities.[6] Together, healthy aging and longevity reinforce each other, good health helps you live longer, while extending your years in good health cultivates a richer quality of life.[5;6;7] Challenges us to reimagine how we approach our later years as a period not of decline, but of continued growth, purpose, and connection.

While our genetic blueprint influences our aging journey, it's our daily choices that truly shape our path to longevity.[6] Research reveals that only about 25% of lifespan variation stems from genetics, while the vast majority reflects lifestyle factors and environmental influences.[6] Among these choices, maintaining social connections emerges as particularly important factor.[8] These human bonds helps reduce stress, provides emotional support, and encourages healthy behaviors.[9] As we progress along our journey, these social connections contribute to our cognitive health and emotional well-being, creating richer and more meaningful life experiences.[9]

This demographic transformation is driving increased interest in understanding the factors that promote healthy aging and extending not just lifespan but also healthspan. The California Teachers Study (CTS) provides a unique opportunity to compare a well-defined population, female educators in California, to the general adult female population in the state.

1.2 The California Teachers Study

The California Teachers Study (CTS) represents one of the most comprehensive longitudinal health research initiatives in the United States, offering invaluable insights into aging patterns, disease development, and health outcomes among a well-defined population cohort. Founded in 1995, the CTS follows 133,477 female teachers, administrators, school nurses, and other members of the California State Teachers Retirement System (CalSTRS).[13] The longitudinal design of this study, with regular follow-up assessments, has enabled researchers to track health trajectories across the lifespan, yielding over 200 academic publications from four partner institutions.[13] The study population presents a unique advantages for aging research due to the relatively homogeneous socioeconomic status and educational attainment of participants.[13;14] Today, the cohort includes both actively employed teachers and those who have transitioned to other professions or retirement, providing a diverse spectrum of life experiences.[14]

The CTS offers remarkable value for research on age distribution and healthy aging through its longitudinal tracking of a large cohort over multiple decades. As participants have advanced from middle to older age, the study has captured valuable data on how health status, disease incidence, and mortality patterns evolve across the aging spectrum.[14] Making it an ideal platform for inves-

tigating factors that promote longevity and well-being across the lifespan. As the cohort continues to age, the CTS is well positioned to offer valuable insights into the complex interplay of biological, behavioral, and environmental factors that shape the aging process.

1.3 Healthy Worker Affect

However, interpreting these findings, especially in workforce populations–requires careful consideration of potential biases inherent in the study population.[16;17] One such bias is the Healthy Worker Effect (HWE). HWE is a well-documented phenomenon in occupational epidemiology that has significant implications for interpreting health outcomes in workforce populations.[15] First described by William Ogle and later termed by AJ McMichael in the 1976, the HWE refers to the tendency for working populations to exhibit lower mortality rates and better overall health outcomes compared to the general population.[15] This effect arises primarily because employed individuals are typically healthier than the general population, which includes children, elderly, and ill individuals who are less likely to be employed.[15]

The healthy worker effect has many components. The two primary components are selection bias, where healthier individuals are more likely to be employed; and survivor bias, where workers who remain employed are generally healthier than those who leave the workforce due to health issues.[16] Employment itself carries health benefits through improved access to healthcare, physical activity, and social connection, all factors that help maintain workers' health.[15] However these benefits does not remain constant over time.[15] The wear-off effect describes how the healthy worker effect diminishes over time as workers age and accumulate exposure to workplace hazards.[15] These effects can mask important relationships between work and health. As global demographics continue to age, understanding HWE becomes equally important for accurately assessing health risks, and promoting healthy aging in working populations.

1.4 Research Aims and Objectives

This leads to our research question: Are California Teachers Study (CTS) participants, on average, older than the general California (CA) population? By analyzing these age distributions over time, we can gain insights into potential longevity advantages and demographic shifts within this cohort.

2 Methods

We conducted a comprehensive age distribution analysis of the California Teachers Study (CTS) cohort compared to the general California female population from 2000-2022. Our analytical approach involved four phases:

Phase I: Initial CTS population analysis (1995-2022). We began by exploring the age distribution of the CTS population across the study period. We calculated descriptive statistics for participant ages at four key timepoints: at enrollment (date of first questionnaire completion); at the time of move-out (for those who left California); at the time of death (for deceased participants); and for active participants (as of December 31, 2022). Additionally, we calculated frequency distributions of the CTS population by status (active, deceased, and moved out of state).

Phase II: Comparative population data preparation. We utilized California census data for adult females from 2000 to 2022, selected based on the availability of reliable demographic information. For comparative analysis, we calculated ages for all CTS participants during this same period. Participants were categorized into 5-year age bands (25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, and 85+). To ensure statistical stability, we excluded any age groups with fewer than 100 CTS participants.

Phase III: Age distribution analysis. We explored age distributions using descriptive statistics and frequency distributions, organizing data into progressive age-year groupings over time for both populations: ages 25+ (Years 2000-2001); ages 30+ (Years 2002-2006); ages 35+ (Years 2007-2011); ages 40+ (Years 2012-2016); ages 45+ (Years 2017-2021); and ages 50+ (Year 2022).

Phase IV: Comparative and visualization analyses. For both populations, we calculated frequency distribution percentages by age group and year. We conducted direct comparisons by: computing side-by-side percentage distributions; calculating percentage differences (CTS minus CA) for each age group and year; and creating visualizations to illustrate temporal trends, including: age distribution histograms, side-by-side percentage comparison graphs; and percentage difference plots between populations over time.

This methodological approach allowed us to systematically examine how the age structure of the CTS cohort evolved compared to the general California female population throughout the study period.

3 Results

The California Teachers Study (CTS) cohort demonstrated an older age distribution over time from 1995 to 2022, with evidence suggesting potential longevity advantages compared to the general California female population.

3.1 CTS Age Characteristic and Participant Status, 1995-2022

At enrollment, participants exhibited a median age of 52 years (mean 54 years), with ages ranging from 22 to 104 years (see Table 1 and Figure 1). Figure 1 shows a right-skewed distribution with the peak around the median age, illustrating how the cohort began with a concentration of middle-aged participants. Establishing the demographic baseline against which subsequent changes can be evaluated. Notably, the median age at death among deceased participants (n=36,520) was 86 years (see Table 1 and Figure 2). Revealing a left-skewed distribution with concentration at advanced ages. For participants who moved out of state (n=17,268), presents a more centralized distribution around the 63 years median age, suggesting that geographic relocation predominantly occurred around retirement age (see Table 1 and Figure 3). As of December 31, 2022, active participants (n=74,572) had a median age of 75 years showing a rightward shift, with the youngest being 49 years old and the oldest 117 years (see Table 1 and Figure 4). Demonstrating both the passage of time and the continued survival of a substantial proportion of participants at advanced ages

In addition, the cohort demonstrated remarkable retention and stability over the nearly three-decade follow-up period. As shown in Table 2, 59.6% of participants remained active in the study as of December 2022, with 29.19% deceased and only 13.8% having moved out of state. This high proportion of active participants after such an extended period further supports potential longevity effects in this population. Together, the CTS cohort shows distinct aging patterns at four key timepoints, showing signs of longevity advantages.

3.2 CTS Age Distribution, 2000-2022

The age structure within the CTS cohort showed systematic transformation from 2000 to 2022 (see Table 3). The most striking pattern was the rightward shift in age distribution concentration. In 2000, the highest percentage (16.1%) appeared in the 50-54 age group, but by 2022, the peak had shifted to the 70-74 age group (19.6%). Several key transition patterns emerged in the age distribution: younger groups (25-39 years) showed rapid decline and eventual disappearance; middle-aged groups (40-64 years) demonstrated gradual decline with transitional patterns; and older groups (65+ years) experienced substantial growth, particularly in the oldest categories. The 85+ age group quadrupled from 3.3% in 2000 to 14.6% in 2022, providing compelling evidence of potential survival advantages within this population.

3.3 Comparative Age Demographics, CTS vs CA 2000-2022

Direct comparison between the CTS cohort and general California female population revealed a widening age gap over the 22-year study period (see Table 4 and Figures 5, 6, 7, 8). In the early years (2000-2006), younger age groups (under 50) were underrepresented in the CTS compared to the general population, while middle and older groups (50+) were overrepresented. As the study progressed through middle years (2007-2014), this pattern shifted upward along the age spectrum. The age bracket showing maximum positive difference migrated from 50-54 years in 2000 (6.7% higher in CTS) to the 65-69 age bracket by 2014 (8.3% higher).

By the later years (2015-2022), the gap became even more pronounced, with dramatic differences in the oldest age categories. The greatest disparity shifted to the 75-79 age bracket in 2022 (9.3% higher in CTS), while the 85+ category showed a progression from just 0.6% higher in 2000 to 8.5% higher in 2022. Figures 5, 6, 7, 8, 9, 10, and 11 demonstrate this evolving age structure change over the 22-year period through different visualization approaches, highlighting the growing disparity in older age groups between CTS and the general California female population.

4 Discussion & Conclusion

4.1 Summary of Key Findings

The California Teachers Study (CTS) cohort exhibited a pronounced aging trend compared to the general California female population from 2000 to 2022. Our analysis revealed a significant shift in age distribution over time, with the highest percentage concentration moving from ages 50-54 in 2000 (16.1%) to ages 70-74 by 2022 (19.6%). This demographic shift resulted in a widening age gap between CTS cohort and the general CA population, most evident in the substantial growth of participants aged 75+ years. By 2022, the 75-79 age group showed a 9.3% higher representation in the CTS cohort compared to the general population, while the 85+ group demonstrated an 8.5% difference (up from just 0.6% in 2000). The consistently higher proportion of individuals in older age groups within the CTS cohort compared to the general population suggests potential longevity or survival advantages. This pattern of aging relative to the general female population points to possible social, economic, educational, or occupational factors influencing healthy aging.

4.2 Interpretation

The observed longevity patterns among California teachers (CTS) likely stem from multiple contributing interconnected factors. (1) Socioeconomic advantages; teachers typically have stable employment, consistent income, and health insurance coverage, which are established social determinants of health associated with longevity. (2) Higher educational attainment; correlates with improved health literacy, better healthcare utilization, and healthier lifestyle choices. (3) Teaching as a profession involves elements conducive to healthy aging; regular cognitive stimulation, meaningful social interaction, and physical activity. (4) The teaching profession may attract individuals with pre-existing health advantages or behavioral tendencies that support longevity. (5) Teachers may represent a healthier subset of the population, as suggested by the healthy worker effect that those with serious health conditions might leave the profession earlier. Together, these combination of factors create potential influences supporting extended lifespans

4.3 Limitation

When interpreting these findings, it's important to distinguish between cohort effects and true aging patterns. Since the CTS follows a defined group established in 1995 rather than representative cross-sections at each time-point, some of the age distribution changes partly reflects the natural collective aging of this closed cohort. However, the widening gap between CTS and general population age distributions suggests differential survival patterns, with lower mortality among teachers (CTS) is also contributing to the observed patterns. In addition, selection methods may also influence these results in following ways: (1) initial recruitment may have attracted healthier or more health-conscious teachers than average, creating baseline differences, and (2) those reaching later follow-up points inherently represent a progressively healthier group (survival bias).

4.4 Implications

If the CTS cohort indeed experience longevity advantages, understanding the specific factors contributing to this phenomenon could inform public health strategies transferable for promoting healthy aging in the general population. These findings warrant further investigation into: (1) specific behavioral, social, and occupational factors that might contribute to the observed longevity patterns; (2) examining whether similar patterns exist among male teachers and other professional groups with comparable profiles; (3) conducting survival analyses. Additionally, (4) examining teachers' lifestyles, stress management techniques, social connections, and health behaviors could provide insights into modifiable factors promoting healthy aging.

4.5 Conclusion

The California Teachers Study cohort demonstrates an increasingly older age distribution compared to the general California female population, suggesting potential longevity advantages. These findings highlight the importance of considering occupational and educational factors when studying population health and longevity patterns. Further investigation into the specific factors underlying these apparent advantages could yield valuable insights for promoting healthy aging in diverse populations.

Competing Interests

I declare no competing interest. This analysis was conducted as part of my MPH coursework for educational purposes only.

Availability of Data and Materials

The California census data used for comparison are publicly available from the United States Census Bureau, (census.gov). For California Teachers Study (CTS) requests, please check the official study website, (calteachersstudy.org). Any code used for the analysis can be obtained from the corresponding author upon reasonable request.

Acknowledgements

We would like to thank all participants of the California Teachers Study for their valuable dedication and contributions to this research. We express our gratitude to James V. Lacey, Jr., Emma Spielfogel, and Kristen Savage for their guidance and support throughout this project. We thank our instructors Elizabeth Levin-Sparenberg and Alexa Eisenberg for their teaching and mentorship. Special thanks to our classmates Adriana Rochelle, Erin Johnson, and Usha Sethuraman for their collaboration and feedback. We also extend our appreciation to all colleagues, classmates, instructors, and every person who supported, guided, and stood by us along the way. We truly couldn't have done it without each and every one of you.

References

[1] World Health Organization. (2024, October 1). Ageing and health. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

[2] Pan American Health Organization. Healthy aging. PAHO. https://www.paho.org/en/healthy-aging

[3] Centers for Disease Control and Prevention. Healthy aging at any age. U.S. Department of Health & Human Services. https://www.cdc.gov/healthy-aging/about/index.html

[4] World Health Organization. (2020, October 26) Healthy ageing and functional ability. https://www.who.int/news-room/questions-and-answers/item/healthy-ageing-and-functional-ability

[5] Cleveland Clinic. (2024, November 11). Lifespan. Cleveland Clinic. https://my.clevelandclinic.org/health/articles/lifespan

[6] Harvard T.H. Chan School of Public Health. (2022, December). Healthy longevity. The Nutrition Source. https://nutritionsource.hsph.harvard.edu/healthy-longevity/

[7] eBioMedicine. (2023). Healthy ageing begins with a healthy lifestyle. eBioMedicine, 87, 104528. https://doi.org/10.1016/j.ebiom.2023.104528

[8] Catanese, L. (2024, June 25). Longevity: Lifestyle strategies for living a healthy, long life. Harvard Health Publishing. https://www.health.harvard.edu/staying-healthy/longevity-lifestyle-strategies-for-living-a-healthy-long-life

[9] National Institute on Aging. (2022, February 23). What do we know about healthy aging? U.S. Department of Health & Human Services. https://www.nia.nih.gov/health/healthy-aging/what-do-we-know-about-healthy-aging

[10] Grimes, D. A., & Schulz, K. F. (2002). Cohort studies: marching towards outcomes. The Lancet, 359(9303), 341-345. https://doi.org/10.1016/s0140-6736(02)07500-1

[11] Caruana, E. J., Roman, M., Hernández-Sánchez, J., & Solli, P. (2015). Longitudinal studies. Journal of thoracic disease, 7(11), E537–E540. https://doi.org/10.3978/j.issn.2072-1439.2015.10.63

[12] Wang, Y., & Zhao, Y. (2023). Cohort studies have great potential in healthy ageing research. The lancet. Healthy longevity, 4(9), e450–e451. https://doi.org/10.1016/S2666-7568(23)00163-0

[13] California Teachers Study. (2024). About us. ttps://www.calteachersstudy.org/about-us

[14] California Teachers Study. (2024). Study population. https://www.calteachersstudy.org/study-population

[15] Chowdhury, R., Shah, D., & Payal, A. R. (2017). Healthy Worker Effect Phenomenon: Revisited with Emphasis on Statistical Methods - A Review. Indian journal of occupational and environmental medicine, 21(1), 2-8. https://doi.org/10.4103/ijoem.IJOEM_53_16

[16] Shah D. (2009). Healthy worker effect phenomenon. Indian journal of occupational and environmental medicine, 13(2), 77–79. https://doi.org/10.4103/0019-5278.55123

[17] Algarni, F. S. (2020). A comprehensive review of the healthy worker effect in occupational epidemiological studies. International Journal of Research in Medical Sciences, 8(9), 3394–3400. https://doi.org/10.18203/2320-6012.ijrms20203702

[18] U.S. Census Bureau. State intercensal tables: 2000-2010. U.S. Department of Commerce. https://www.census.gov/data/tables/time-series/demo/popest/intercensal-2000-2010-state.html

[19] U.S. Census Bureau. State population by characteristics: 2010-2019. U.S. Department of Commerce. https://www.census.gov/data/datasets/time-series/demo/popest/2010s-state-detail.html

[20] U.S. Census Bureau. State population by characteristics: 2020-2024. U.S. Department of Commerce. https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-detail.html

[21] California Teachers Study. CTS data, 1995–2022. California Teachers Study. https://www.calteachersstudy.org/

Appendix A: Tables

Table 1: Age Characteristics at Key Timepoints, CTS 1995–2022

		age (yrs)						
Time Period	Count	Min	P25	Median	P75	Max	Mean	SD
Enrollment	125,119	22	44	52	64	104	54	15
Death	36,520	29	77	86	91	115	83	11
Move-Out	17,268	24	55	63	73	104	63	15
Current (12-31-2022)	74,572	49	67	75	82	117	75	11

Table 2: Participant Status, CTS 1995–2022 *(as of December 31, 2022)*

Status		Count	Percent (%)
Deceased			
	No	88,599	70.81
	Yes	36,520	29.19
Move-Out			
	No	107,851	86.2
	Yes	17,268	13.8
Active (12-31-2022)			
	No	50,547	40.4
	Yes	74,572	59.6

Table 3: Age Structure, CTS 2000-2022 *(values in percentage)*

Age Group	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
25-29	0.9	0.3																					
30-34	4.4	3.9	3.2	2.4	1.7	0.9	0.4																
35-39	6.2	6	5.7	5.5	5	4.6	4.1	3.4	2.6	1.8	1	0.4											
40-44	7.3	7	6.7	6.6	6.6	6.5	6.4	6.1	5.8	5.3	4.9	4.4	3.7	2.8	1.9	1.1	0.4						
45-49	11.9	10.9	10.1	9.2	8.4	7.8	7.5	7.3	7.1	7.1	7	6.9	6.6	6.3	5.8	5.4	4.8	4	3	2.1	1.2	0.5	
50-54	16.1	16.2	15.4	14.4	13.5	12.6	11.7	10.8	9.9	9	8.4	8.1	7.9	7.7	7.8	7.7	7.5	7.2	6.9	6.4	5.9	5.3	4.5
55-59	13.6	14.2	15.3	16.2	16.6	16.9	17.1	16.3	15.3	14.5	13.5	12.5	11.6	10.6	9.7	9.1	8.8	8.6	8.4	8.5	8.4	8.3	8
60-64	9.9	10.5	11.2	12.1	13	13.8	14.5	15.7	16.7	17.2	17.7	17.8	17.2	16.1	15.3	14.3	13.3	12.4	11.4	10.5	9.8	9.6	9.4
65-69	8.6	8.6	8.7	9	9.6	10	10.7	11.3	12.4	13.4	14.3	15.1	16.4	17.5	18	18.6	18.8	18.2	17.2	16.4	15.4	14.4	13.4
70-74	7.9	8.2	8.4	8.5	8.5	8.6	8.6	8.9	9.2	9.8	10.3	11.1	11.8	12.9	14	14.9	15.8	17.3	18.5	19.2	19.8	20.2	19.6
75-79	6	6.2	6.5	6.9	7.3	7.7	8	8.3	8.4	8.4	8.5	8.7	9	9.4	10.1	10.6	11.3	12.2	13.4	14.5	15.6	16.6	18.3
80-84	4	4.4	4.8	5	5.3	5.5	5.7	6	6.4	6.8	7.2	7.5	7.8	7.9	8.1	8.3	8.4	8.7	9.2	9.9	10.6	11.4	12.2
85+	3.3	3.7	4	4.3	4.7	5.1	5.5	5.9	6.3	6.7	7.2	7.7	8.2	8.8	9.4	10.1	10.8	11.5	12	12.6	13.2	13.8	14.6

Table 4: Comparative Age Demographics: CTS and CA, 2000-2022

(values in percentage)

(a) Years 2000-2006

	2000			2001			2002			2003			2004			2005			2006		
Age Group	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff
25-29	0.9	11.3	−10.4	0.3	11.0	−10.6															
30-34	4.4	12.0	−7.5	3.9	12.0	−8.0	3.2	13.2	−10.0	2.4	13.0	−10.6	1.7	12.6	−11.0	0.9	12.2	−11.2	0.4	11.8	−11.5
35-39	6.2	12.7	−6.5	6.0	12.3	−6.4	5.7	13.5	−7.8	5.5	13.1	−7.7	5.0	12.8	−7.9	4.6	12.7	−8.2	4.1	12.7	−8.6
40-44	7.3	12.2	−4.9	7.0	12.2	−5.2	6.7	13.7	−6.9	6.6	13.6	−7.0	6.6	13.5	−6.9	6.5	13.3	−6.7	6.4	12.9	−6.6
45-49	11.9	10.9	1.0	10.9	11.0	−0.1	10.1	12.5	−2.5	9.2	12.6	−3.4	8.4	12.6	−4.2	7.8	12.7	−4.9	7.5	12.7	−5.2
50-54	16.1	9.4	6.7	16.2	9.8	6.4	15.4	10.9	4.5	14.4	11.0	3.4	13.5	11.1	2.4	12.6	11.3	1.4	11.7	11.4	0.2
55-59	13.6	7.0	6.6	14.2	7.2	7.0	15.3	8.6	6.7	16.2	8.9	7.3	16.6	9.3	7.3	16.9	9.7	7.3	17.1	10.0	7.0
60-64	9.9	5.5	4.4	10.5	5.6	4.9	11.2	6.4	4.7	12.1	6.7	5.5	13.0	6.9	6.2	13.8	7.1	6.8	14.5	7.2	7.3
65-69	8.6	4.8	3.7	8.6	4.8	3.8	8.7	5.4	3.4	9.0	5.4	3.6	9.6	5.5	4.1	10.0	5.5	4.5	10.7	5.6	5.1
70-74	7.9	4.6	3.2	8.2	4.5	3.7	8.4	5.0	3.5	8.5	4.8	3.6	8.5	4.8	3.8	8.6	4.7	3.9	8.6	4.7	3.9
75-79	6.0	4.2	1.8	6.2	4.1	2.1	6.5	4.5	1.9	6.9	4.5	2.4	7.3	4.3	2.9	7.7	4.3	3.4	8.0	4.2	3.9
80-84	4.0	2.8	1.2	4.4	2.9	1.5	4.8	3.3	1.4	5.0	3.4	1.6	5.3	3.5	1.8	5.5	3.5	2.0	5.7	3.5	2.3
85+	3.3	2.7	0.6	3.7	2.7	1.0	4.0	3.0	1.0	4.3	3.1	1.2	4.7	3.1	1.6	5.1	3.2	1.9	5.5	3.2	2.2

(b) Years 2007-2014

	2007			2008			2009			2010			2011			2012			2013			2014		
Age Group	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff
25-29																								
30-34																								
35-39	3.4	14.2	−10.8	2.6	13.9	−11.3	1.8	13.5	−11.8	1.0	13.1	−12.1	0.4	12.7	−12.4									
40-44	6.1	14.2	−8.1	5.8	13.8	−8.0	5.3	13.5	−8.2	4.9	13.3	−8.5	4.4	13.3	−8.9	3.7	15.1	−11.4	2.8	14.8	−12.0	1.9	14.4	−12.5
45-49	7.3	14.3	−7.1	7.1	14.2	−7.1	7.1	14.1	−7.0	7.0	13.8	−6.8	6.9	13.4	−6.6	6.6	14.9	−8.3	6.3	14.5	−8.2	5.8	14.2	−8.4
50-54	10.8	13.2	−2.4	9.9	13.3	−3.4	9.0	13.3	−4.3	8.4	13.4	−5.0	8.1	13.3	−5.2	7.9	15.1	−7.2	7.7	15.0	−7.3	7.8	14.8	−7.0
55-59	16.3	11.3	5.1	15.3	11.4	3.9	14.5	11.6	2.9	13.5	11.7	1.8	12.5	11.9	0.5	11.6	13.8	−2.2	10.6	13.9	−3.3	9.7	13.9	−4.1
60-64	15.7	8.8	6.9	16.7	9.1	7.6	17.2	9.5	7.7	17.7	9.9	7.8	17.8	10.2	7.6	17.2	11.7	5.5	16.1	11.8	4.4	15.3	11.9	3.4
65-69	11.3	6.5	4.8	12.4	6.8	5.6	13.4	7.0	6.4	14.3	7.2	7.1	15.1	7.4	7.7	16.4	9.0	7.4	17.5	9.4	8.1	18.0	9.7	8.3
70-74	8.9	5.3	3.5	9.2	5.4	3.8	9.8	5.4	4.4	10.3	5.5	4.9	11.1	5.6	5.5	11.8	6.5	5.3	12.9	6.8	6.1	14.0	7.0	7.0
75-79	8.3	4.6	3.7	8.4	4.5	3.8	8.4	4.5	3.9	8.5	4.4	4.1	8.7	4.4	4.3	9.0	5.1	3.9	9.4	5.1	4.3	10.1	5.2	4.9
80-84	6.0	3.9	2.1	6.4	3.8	2.6	6.8	3.7	3.1	7.2	3.7	3.6	7.5	3.6	3.9	7.8	4.1	3.7	7.9	4.0	3.9	8.1	4.0	4.1
85+	5.9	3.8	2.2	6.3	3.9	2.5	6.7	4.0	2.8	7.2	4.0	3.1	7.7	4.1	3.6	8.2	4.8	3.4	8.8	4.8	4.0	9.4	4.9	4.6

(c) Years 2015-2022

	2015			2016			2017			2018			2019			2020			2021			2022		
Age Group	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff	CTS	CA	diff
25-29																								
30-34																								
35-39																								
40-44	1.1	14.0	−12.9	0.4	13.6	−13.2																		
45-49	5.4	14.1	−8.8	4.8	14.1	−9.3	4.0	16.1	−12.1	3.0	15.8	−12.8	2.1	15.4	−13.3	1.2	15.2	−14.0	0.5	14.8	−14.4			
50-54	7.7	14.5	−6.8	7.5	14.1	−6.6	7.2	15.8	−8.6	6.9	15.4	−8.5	6.4	15.1	−8.7	5.9	15.2	−9.3	5.3	15.2	−9.9	4.5	17.7	−13.2
55-59	9.1	13.9	−4.8	8.8	13.9	−5.1	8.6	15.9	−7.3	8.4	15.7	−7.3	8.5	15.6	−7.1	8.4	15.5	−7.1	8.3	15.1	−6.9	8.0	17.2	−9.2
60-64	14.3	12.1	2.3	13.3	12.2	1.1	12.4	14.3	−1.9	11.4	14.4	−3.1	10.5	14.4	−3.9	9.8	14.5	−4.7	9.6	14.5	−5.0	9.4	16.9	−7.5
65-69	18.6	10.1	8.5	18.8	10.4	8.4	18.2	12.0	6.2	17.2	12.1	5.1	16.4	12.2	4.1	15.4	12.5	3.0	14.4	12.6	1.7	13.4	14.9	−1.5
70-74	14.9	7.2	7.7	15.8	7.4	8.4	17.3	9.2	8.1	18.5	9.5	9.1	19.2	9.9	9.3	19.8	10.2	9.7	20.2	10.5	9.7	19.6	12.3	7.3
75-79	10.6	5.3	5.3	11.3	5.4	6.0	12.2	6.4	5.8	13.4	6.7	6.7	14.5	6.9	7.6	15.6	6.9	8.7	16.6	7.1	9.5	18.3	9.0	9.3
80-84	8.3	4.0	4.3	8.4	4.0	4.4	8.7	4.6	4.1	9.2	4.7	4.5	9.9	4.8	5.2	10.6	4.7	5.9	11.4	4.8	6.6	12.2	5.8	6.4
85+	10.1	4.9	5.2	10.8	4.9	5.9	11.5	5.7	5.8	12.0	5.7	6.3	12.6	5.7	6.8	13.2	5.3	7.9	13.8	5.3	8.6	14.6	6.2	8.5

Appendix B: Figures

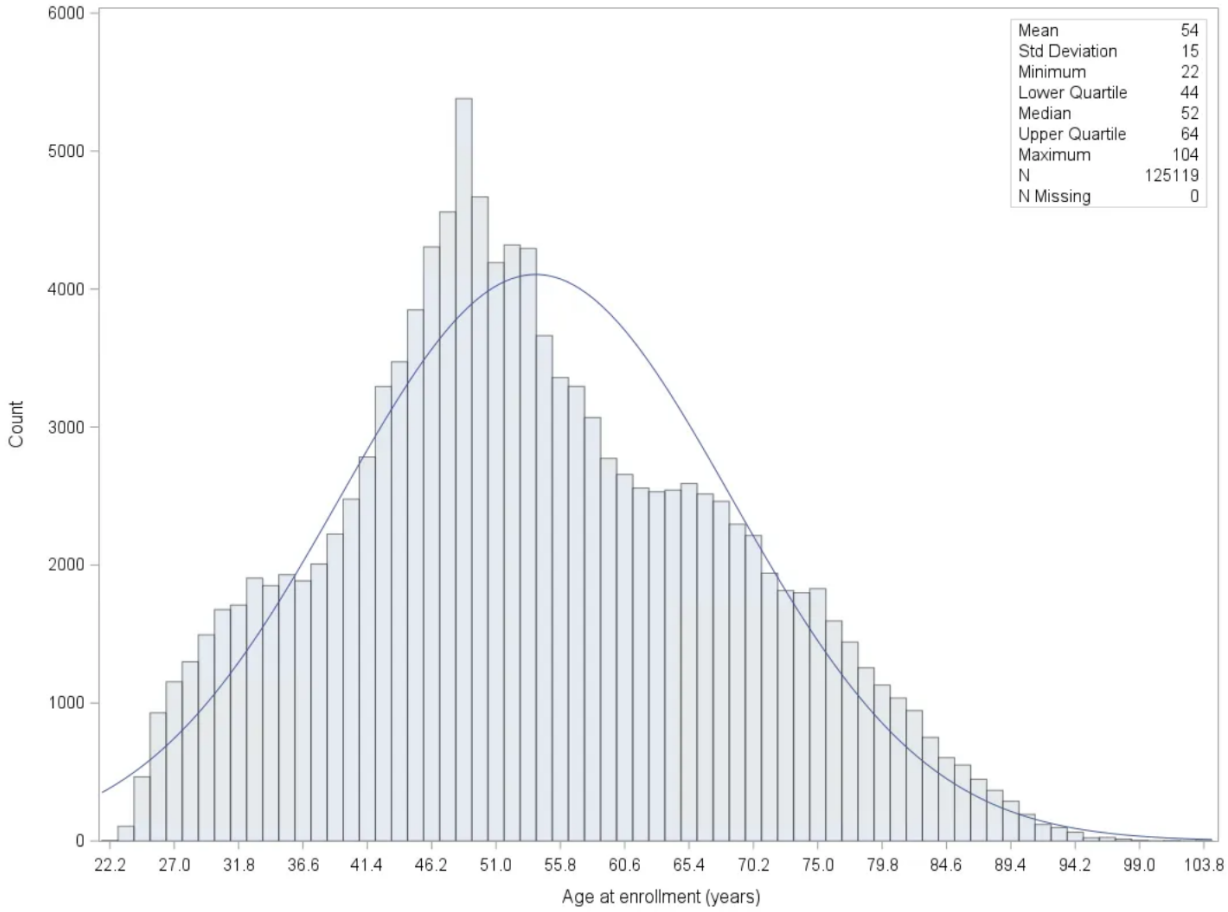

Figure 1: Histogram: Age Distribution of CTS Participants at enrollment

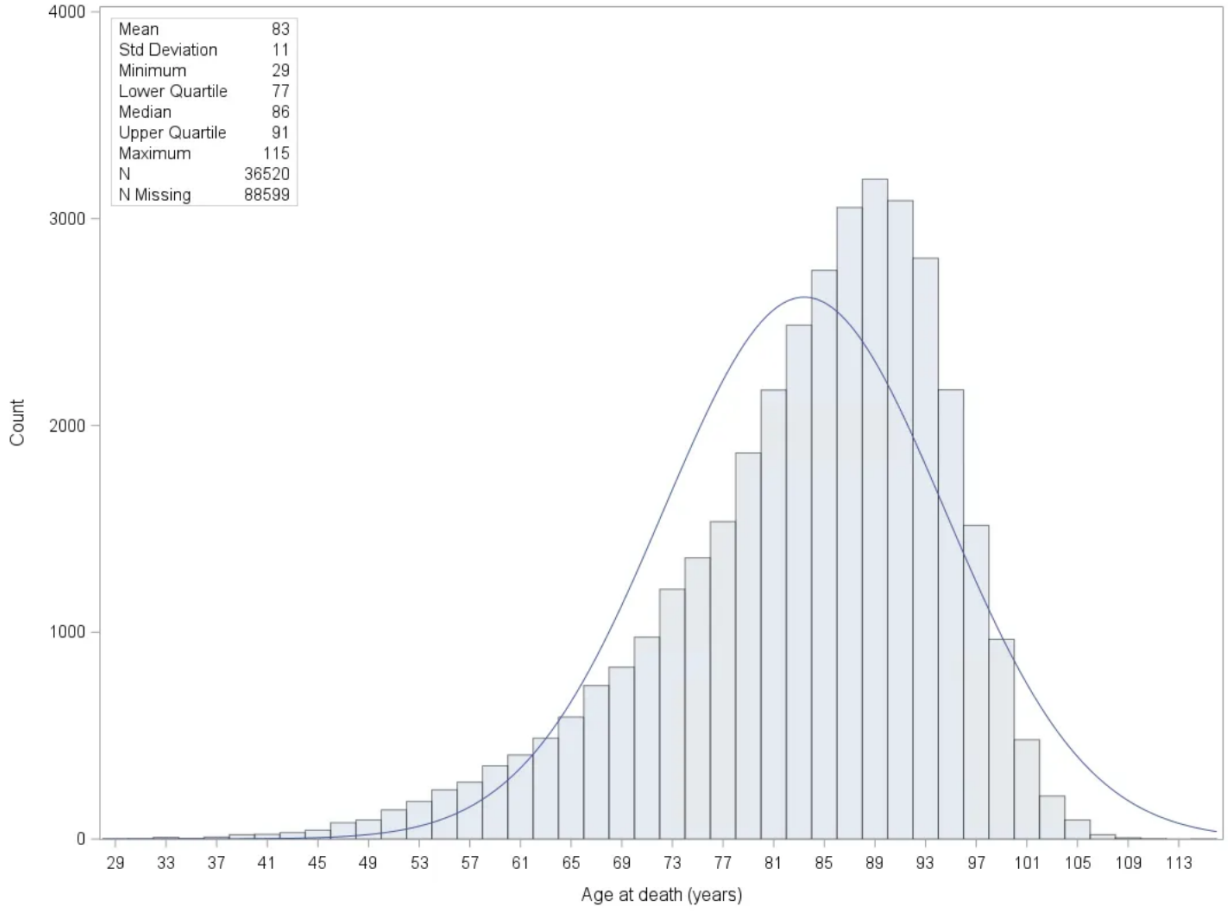

Figure 2: Histogram: Age Distribution of CTS Participants at death

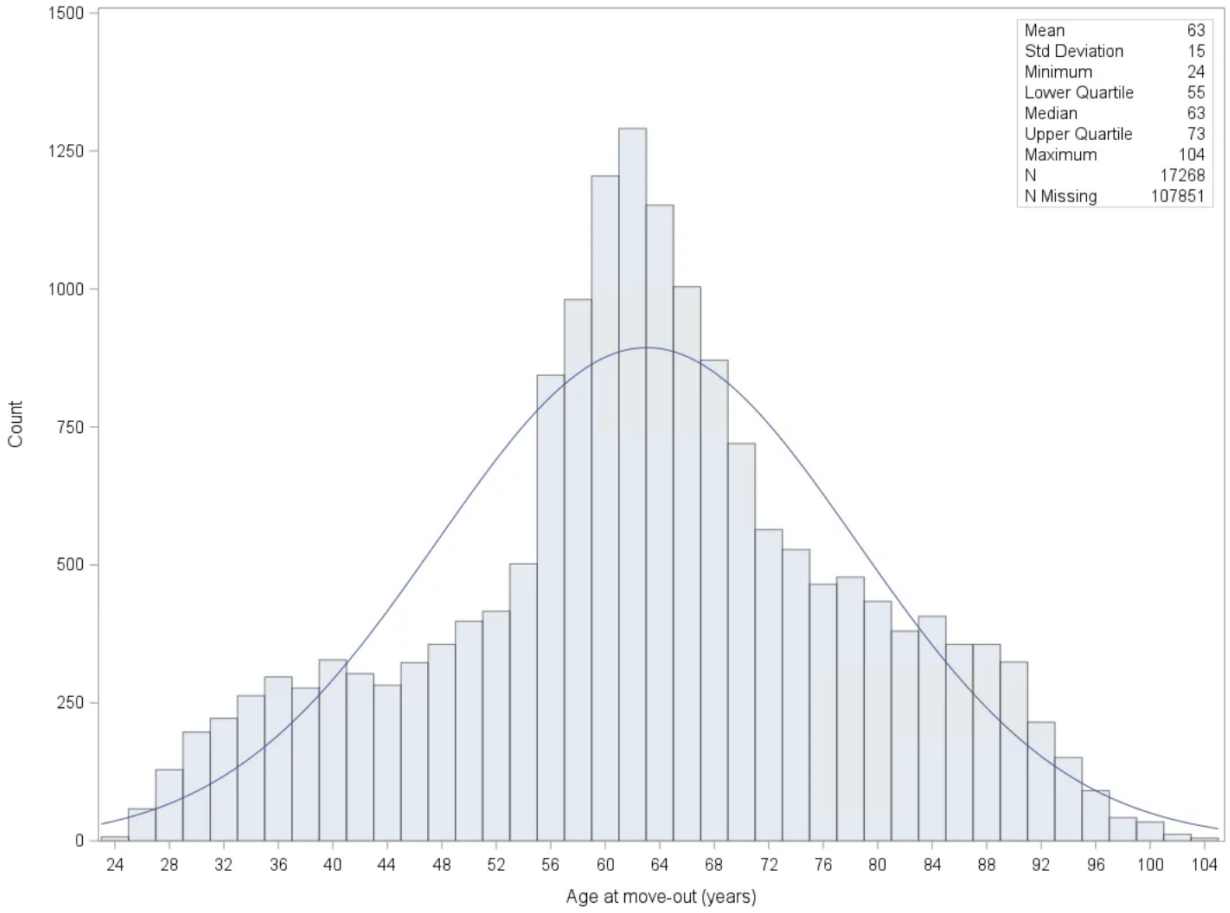

Figure 3: Histogram: Age Distribution of CTS Participants at move-out

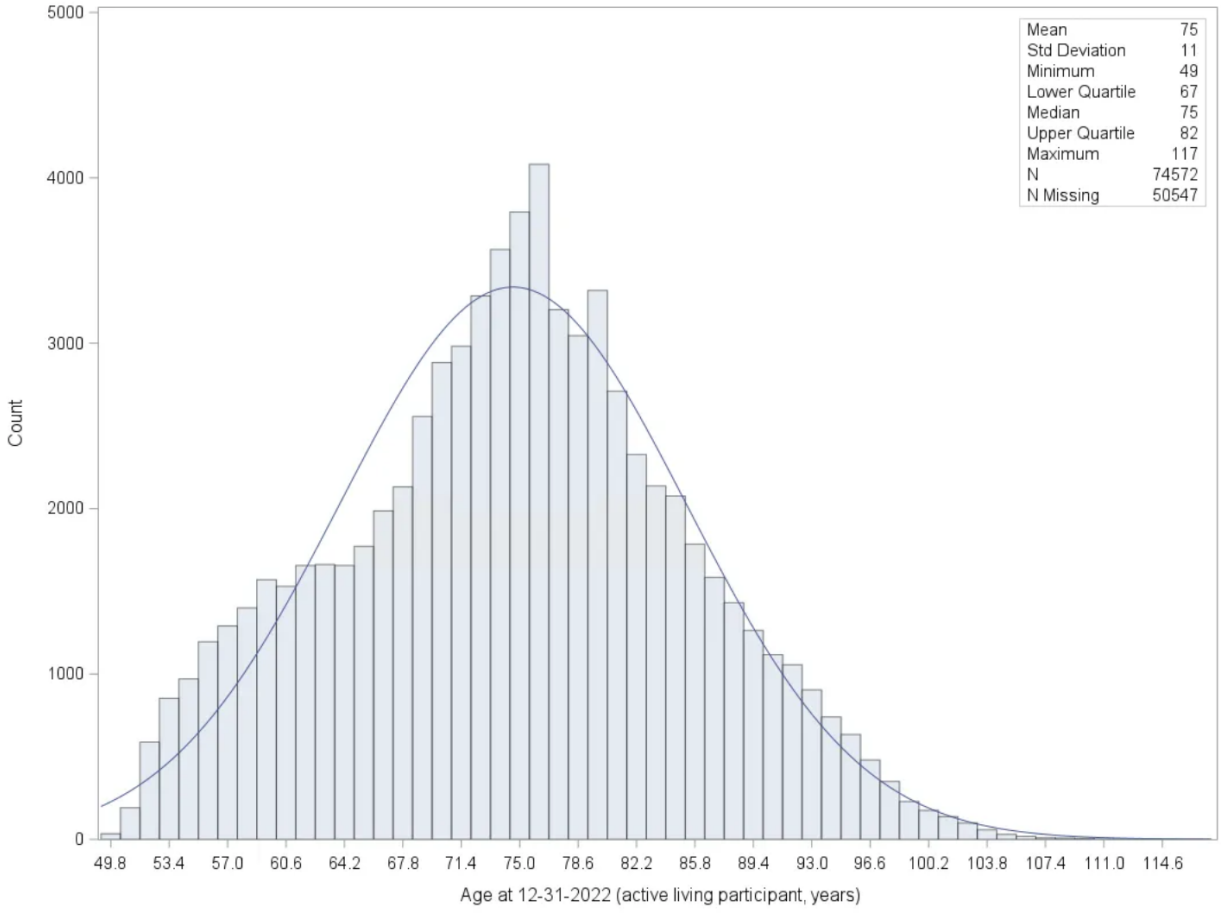

Figure 4: Histograms: Age Distribution of CTS Participants at current status

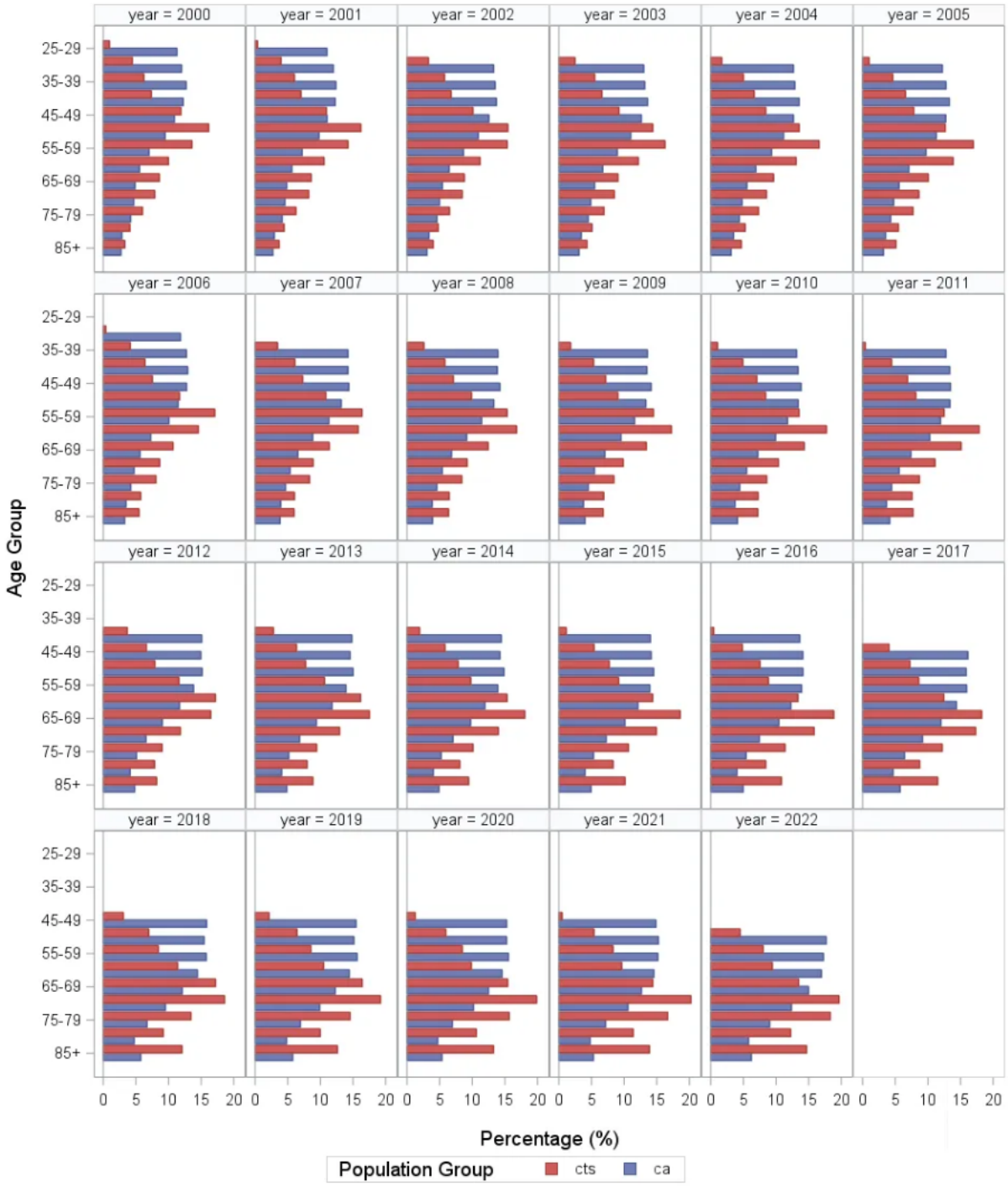

Figure 5: Age Group Distribution Year to Year Comparison, CTS and CA, 2000-2022

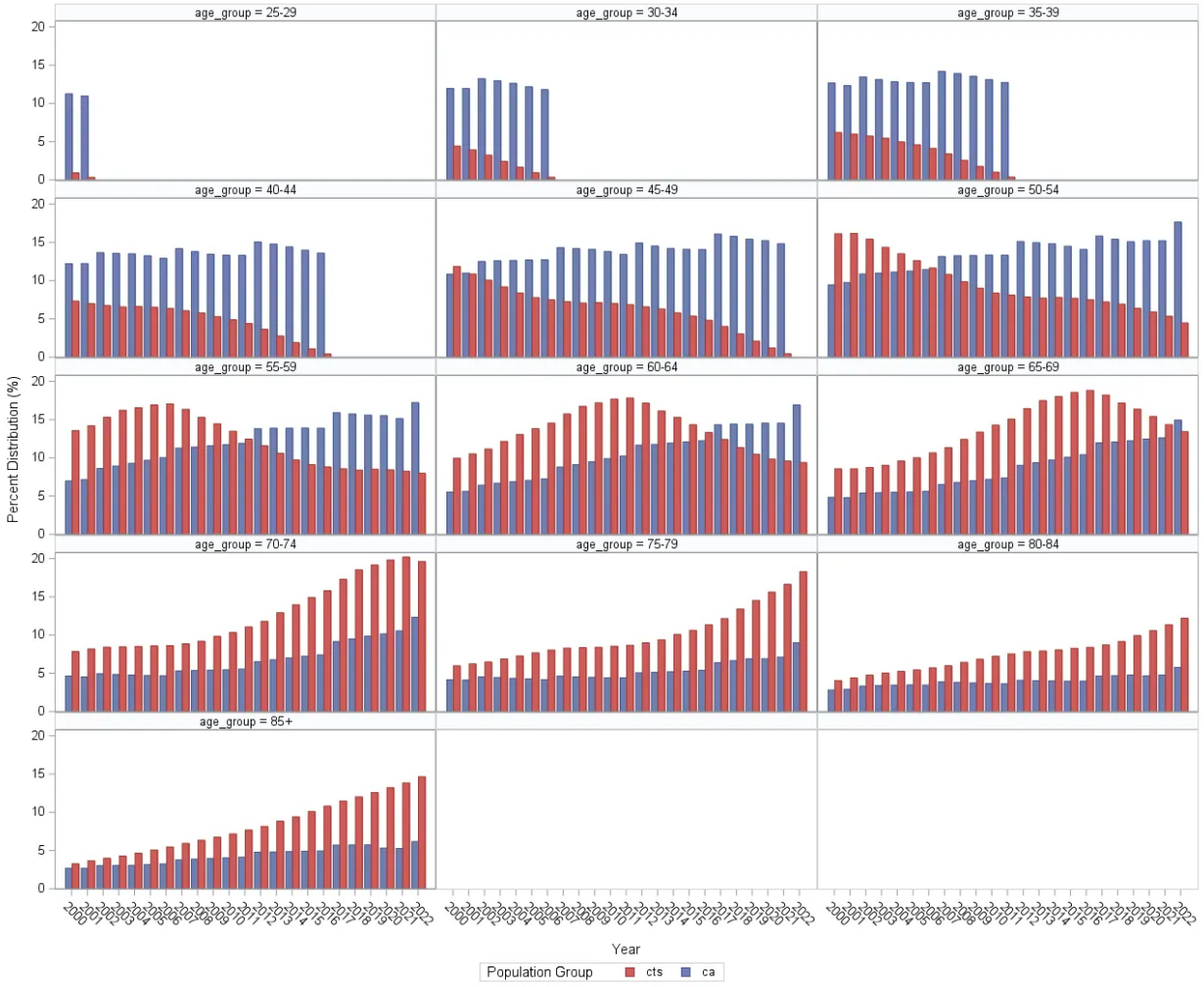

Figure 6: Age Group Distribution Changes Over Time, CTS and CA, 2000-2022

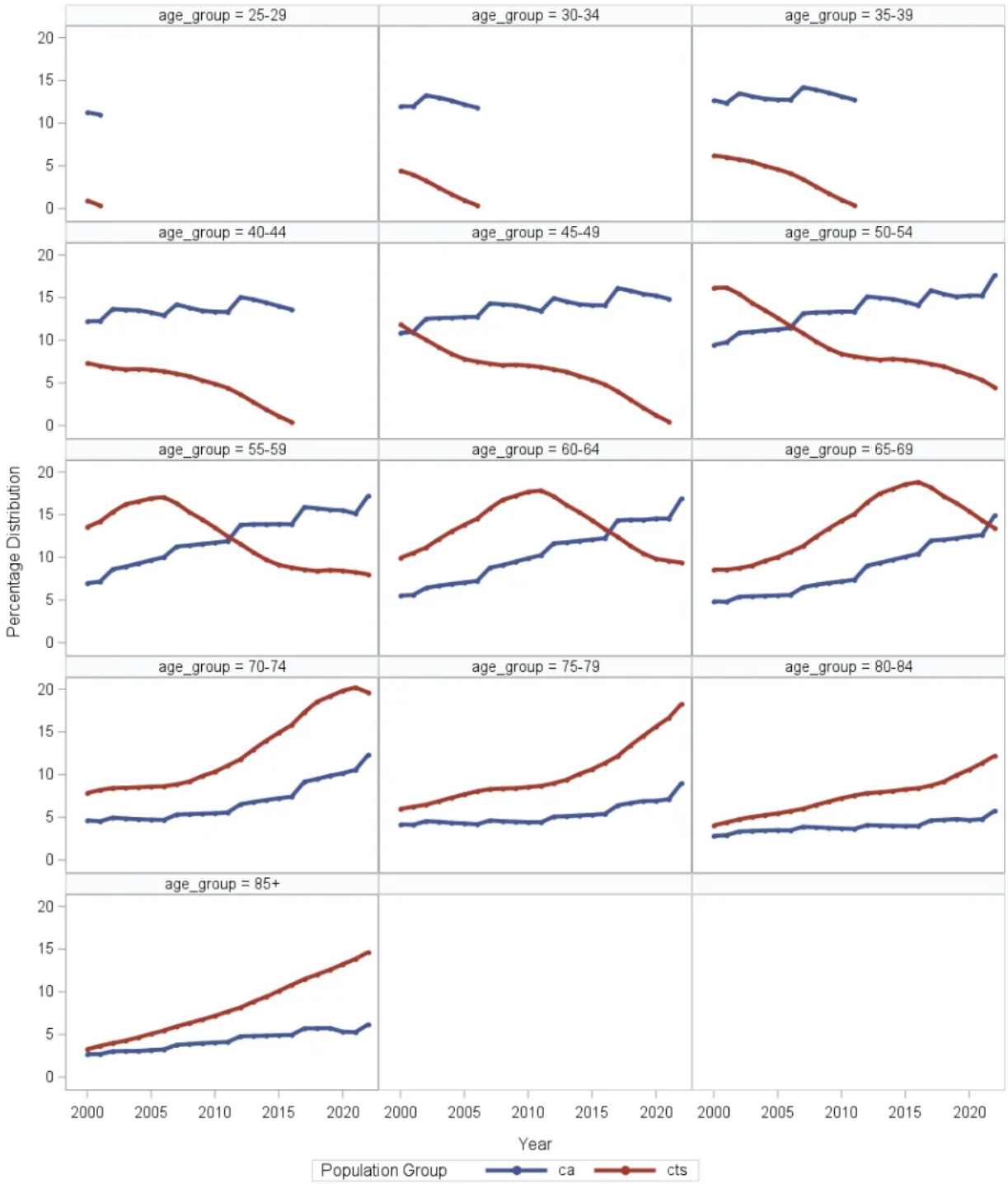

Figure 7: Age Group Trends Over Time, CTS and CA, 2000-2022

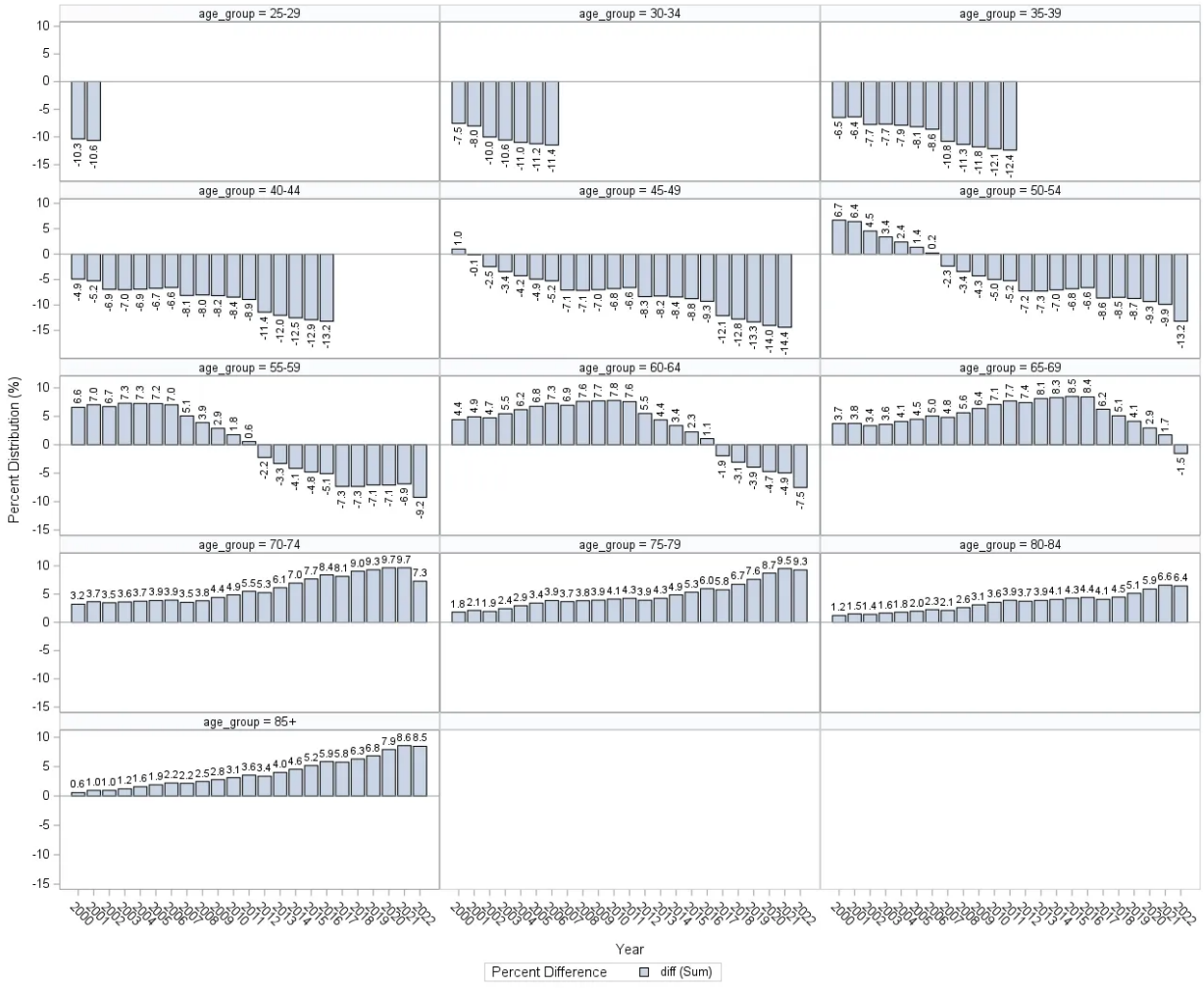

Figure 8: Percent Difference in Age Distribution, CTS and CA, 2000-2022

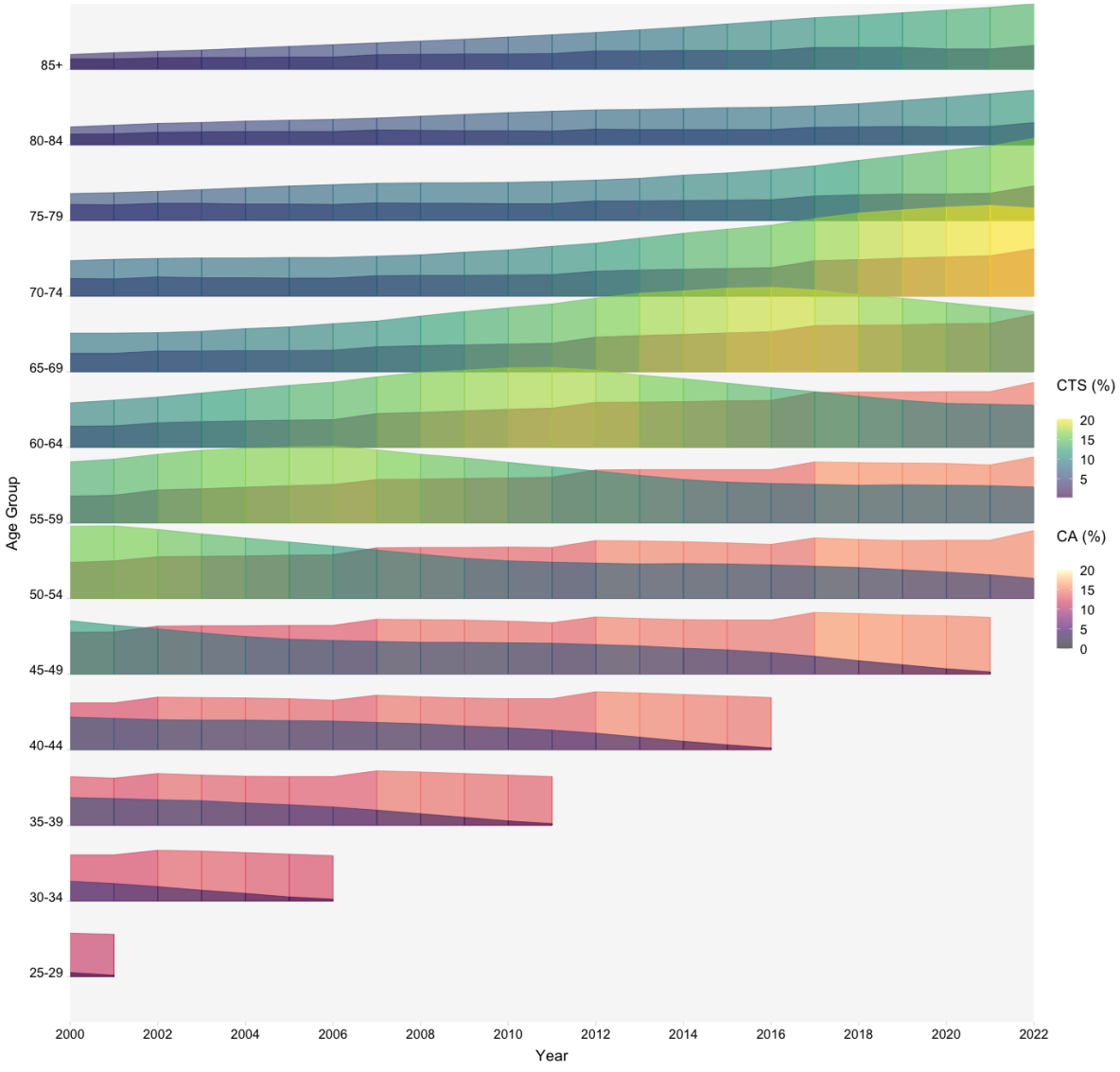

Figure 9: Streamgraph: Age Group Distribution Comparison, CTS and CA, 2000-2022

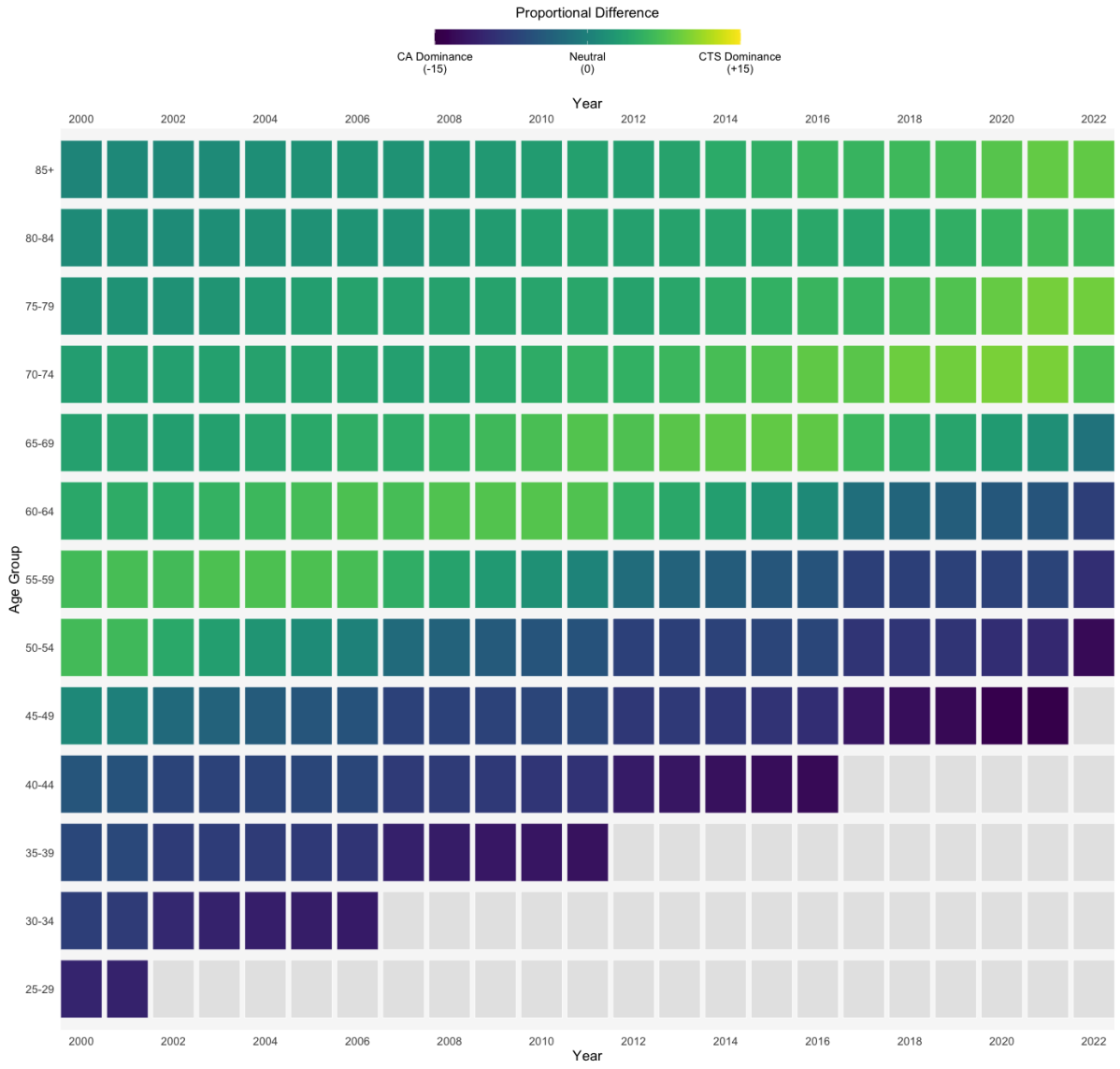

Figure 10: Heatmap: Age Group Distribution Differences, CTS and CA, 2000-2022

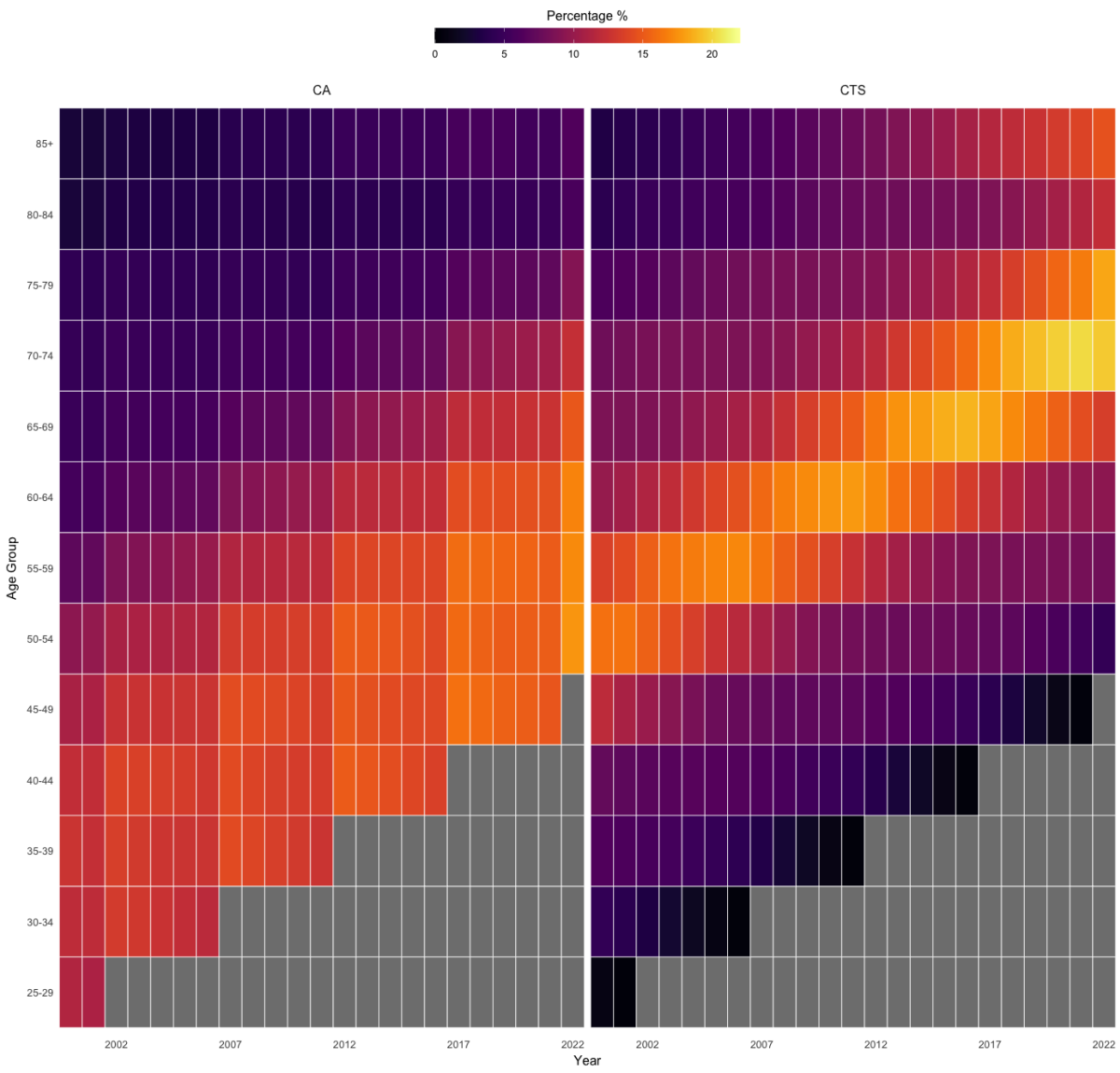

Figure 11: Heatmap: Age Group Distribution Comparison, CTS and CA, 2000-2022