TECHNICAL APPENDIX

Introduction

Underlying assumptions and data constraints are inherent in any projections and must be understood to determine the appropriate uses and interpretations of the projections. The historical reported counts and the projections of high school graduates in this edition of *Knocking at the College Door* rely on several types of data accumulated over many years and spanning over three decades, from school year (SY) 2000-01 to 2022-23. The sections below provide an overview of the projection methodology, pertinent information relating to the data underlying the projections, influential factors implicitly modeled in the projections, and other technical information that may be useful to users exploring the data in greater depth. Of continued relevance for this edition of projections are the lingering impacts from the COVID-19 period, referenced in this Technical Appendix, and the main *Knocking at the College Door* report issued with the projections in December 2024.

Methodology overview

WICHE's *Knocking at the College Door* projections of high school graduates are produced using a methodology known as the cohort survival ratio (CSR) approach, which is essentially an observation from the count data sources of the progression of the number of students/individuals from birth to first grade, through each grade, and eventually from the 12th grade to high school graduates. WICHE uses these calculated ratios to project the number of enrollments and graduates in the coming years. WICHE uses a five-year smoothed average ratio to make projections to place relatively greater weight on the most recent year's data without masking or eliminating any trends that would be evident by taking a longer view. Each cohort survival ratio is calculated as shown in the formula in Figure A-1:

Figure A-1. Five-year weighted average cohort survival ratio formula

$$Y_{pt} = wY_{p(t-1)} + (1-w)\frac{\sum_{i=2}^{5} Y_{p(t-i)}}{4},$$

Where Y_{pt} is the CSR at a given progression point *p* in year *t*, and *w* is the smoothing weight (equal to 0.4 in the first year and .15 for each of the four prior years in WICHE's methodology). In simple terms:

- The CSR methodology calculates the difference between the enrollments in a given grade in one school year and those in the subsequent grade level the following year. For example, if there were 100 first graders in the 2018-19 school year and 98 second graders in 2019-20, the ratio of second graders to first graders was 0.98. (Although this publication focuses on high school graduates, the CSR methodology also produces grade-level enrollment projections.)
- The ratio of 12th graders to graduates indicates the ratio between the reported count of 12th graders in a school year to the number of high school graduates (the graduate counts encompass all graduates throughout the school year but largely reflect those who graduate in the spring term).
- WICHE also uses data on births from the National Center for Health Statistics (NCHS) to derive the ratio of the number of children born in a given year compared to the number of first graders reported approximately six years later, to extend the graduate projections beyond what can be projected from reported enrollments. Thereby, the last year for which graduates can be projected is 17-18 years past the last available year of births data, which is approximately when the most recently born children would be graduating from high school.

WICHE uses the CSR methodology for reasons similar to why educational planners in schools, school districts, states, and the federal government use it – because its relative simplicity and transparency meet the wide-ranging needs of its users. But perhaps an even greater strength of this methodology is that only a limited amount of data are required. Despite the relative simplicity of the CSR methodology, studies have shown that it is reasonably accurate for short-term projections and even for small populations.[1] While alternative methodologies exist that provide short-term projections that are as accurate as CSR, this equivalence is offset by the fact that the alternative methodologies have more extensive data requirements and employ techniques that are less easily understood by non-statisticians.[2]

Also, while the methodology involves student progression ratios, the data WICHE uses and the resulting projections are of total annual high school graduates (except as noted in state Data Sources and Notes). The projections are not computed from any specific graduation rate, although analysis indicates that the progression ratios generally track official graduation rate trends. When the number of graduates is not available from a state, WICHE may use as detailed data on graduation rates as available to estimate actual graduates.

11th Edition adjustment for COVID-19 enrollment anomalies

Anomalous events or data circumstances may impact the performance of WICHE's traditional CSR approach, and WICHE is careful to ensure that anomalies are not amplified in implausible ways. In this edition, the five-year smoothed average ratio was influenced by the disruptive enrollment patterns that are particularly evident in the 2020-21 school year. Table A-1 demonstrates this impact on public school enrollments at the national level.

Table A-1. Ratios of students (in number) progressing from one level to the next

Year	Grade Level											
	1	2	3	4	5	6	7	8	9	10	11	12
2017-18	93%	100%	101%	100%	100%	100%	101%	100%	107%	96%	95%	99%
2018-19	92%	100%	101%	100%	100%	100%	101%	100%	106%	96%	95%	99%
2019-20	93%	100%	101%	100%	101%	101%	101%	100%	107%	97%	95%	99%
2020-21*	88%	97%	98%	98%	98%	99%	99%	99%	104%	96%	96%	100%
2021-22	87%	100%	100%	100%	100%	100%	100%	100%	107%	97%	95%	99%
2022-23	91%	101%	102%	101%	101%	101%	101%	101%	107%	96%	96%	99%
2023-24**	90%	100%	101%	100%	100%	100%	100%	100%	107%	96%	95%	99%
2024-25	90%	100%	100%	100%	100%	100%	100%	100%	106%	96%	95%	99%
2025-26	90%	100%	100%	100%	100%	100%	100%	100%	106%	96%	95%	99%
2026-27	90%	100%	100%	100%	100%	100%	100%	100%	107%	96%	95%	99%

Source: WICHE analysis of Common Core of Data. Note: Ratios compound over time to produce future graduates (e.g., graduates in 2041 will reflect progression of Fqll 2029 first graders through each grade to twelfth grade).
* 2020-21 highlights the particularly disrupted enrollment ratios. **2023-24 and subsequent highlight the weighted average ratios that would used in making projections.

The progression ratios for Fall 2020 are lower on average than those for Fall 2019 and the ratios for Fall 2021 through Fall 2022 (the end of reported data). This suggests that the apparent "dip" in Fall 2020 is not likely to perpetuate into the future, so WICHE elected to modify the methodology. Leaving the rates as-is would, in WICHE's opinion, bias the estimates downward, resulting in underprojections.

There is precedent for WICHE needing to adjust the methodology to avoid a biased forecast driven by a one-time data phenomenon or a significant occurrence. Specifically,

WICHE adjusted the methodology for its 2016 edition of projections to avoid perpetuating anomalous patterns in the race and ethnicity series related to states' phased-in implementation of new federal race and ethnicity standards between 2010 and 2012.

In this current case, states across the country saw substantial unpredicted decreases in enrollments between fall 2019 and fall 2020, but there is variation in the overall pattern. There is some variation by grade and year between 2019 and 2022. A sophisticated model that senses and adjusts for variation from historical ratio patterns at a very fine level of detail might be a preferred approach for anomalies. However, this was not feasible, and WICHE preferred a uniform and conservative approach to adjusting our longstanding methodology.

WICHE evaluated two approaches for adjusting the base methodology for this anomalous event and data impact by simulating five years of enrollment and graduate projections for 2015-16 to 2019-20. These simulated models used state-level public school enrollment and graduate counts for 2009-10 to 2014-15.[3] This allowed for comparing the adjustment options with the five most recent years of enrollments preceding the abrupt enrollment changes in fall 2020. WICHE then compared the accuracy of the simulated alternative projections to the projections produced using the standard methodology.

The compared alternatives were:

- A four-year weighted average ratio method that excluded the 2011-to-2012 ratio (to be synonymous with excluding the progression ratios between fall 2019 and fall 2020 in the problematic pandemic year) and balanced 60% of the total weight across three of the prior four years, until the 2018-19 projection. The standard five-year weighted average ratio method was resumed by the 2018-19 projection, when the 2011-to-2012 ratio was outside the span of the averaged ratio. Although the ratios calculated from the four-year weighted average perpetuate through the calculations after 2018-19 because they were used to calculate the previous years' ratios, their impact greatly diminishes with each additional year calculated.
- A five-year weighted average ratio method using the same weighting approach as the standard method but excluding the student progression ratios between fall 2011 and fall 2012 (simulating the exclusion of the fall 2019 to 2020 ratio) and instead including one additional past year for a total of five ratios. The standard five-year weighted average ratio method was resumed by the 2018-19 projection.

These two approaches were then compared to the output from WICHE's standard five-year weighted average ratio method (described above) using all relevant consecutive ratios.

A detailed assessment of the simulations on pre-COVID-19 data showed that the four-year weighted average excluding the 2019-to-2020 ratio produced national graduate projections nearly identical to our standard model (within about 0.1% 10 years into the future). It

is essential to understand that our criterion for judging the results of the two possible alternative approaches was how close either came to our standard model given the same data inputs, not the actual enrollment and graduation numbers. In this way, rather than post hoc adjustments to the model to get closer to the truth, we have focused on producing results most consistent with our standard model, given that the extensive assessments and evaluations of the CSR approach have shown its strength.

Assessing the results and concluding based on the evidence that the four-year weighted average ratio method was the best alternative for the enrollment anomaly, WICHE then produced this 11th edition of projections for the public schools series using this adjusted approach: a four-year weighted average ratio that excluded the 2019-to-2020 ratio and balanced 60% of the total weight across three of the prior four years, until the 2025-26 projection. The standard five-year weighted average ratio method was resumed by the 2025-26 projection when the 2019-to-2020 ratio was outside the span of the averaged ratio.

Additional Notes on Methodology Adjustment

- The projections rely on the reduced enrollment levels evident in Fall 2020 to Fall 2022 (which reflect the ongoing population changes and pandemic impacts); no available student counts were excluded.
- The standard five-year weighted average ratio method was used for calculating the progression ratio between 12th grade and graduation because there was no evidence of anomalous decreases in these ratios, as in the public school enrollments.
- For the private school projections, WICHE modeled projections using all three alternatives but ultimately used the standard five-year weighted average ratio method. While WICHE's research indicated that private schools may also have had substantial enrollment changes after 2019, the nature of the available private school data and WICHE's usual process for producing yearly estimates does not necessitate the adjustment. The Private School Universe Survey reports data for odd-numbered years. WICHE imputes the even-numbered years. Our assessment is that this approach conceptually serves the same purpose as our adjustment by smoothing an anomalous data point. Historically, private school sector patterns vary more geographically than the public sector and have generally been more volatile than the public sector even prior to the pandemic. Therefore, WICHE decided to use the historical method with no adjustments.

Table A-2 summarizes the percentage difference between total and public high school graduate projections for the nation and regions using WICHE's standard methodology and the adjusted method chosen for this edition of projections.

Table A-2. Comparison of graduate projections using standard and adjusted models

Public Schools								Total of Public and Private Schools*
Class of	White	Hispanic	Black	Asian or Pacific Islander	American Indian/ Alaska Native	Multi-racial	Total	
Nation								
2025	0%	0%	-1%	0%	0%	0%	**0%**	**0%**
2030	1%	2%	0%	1%	1%	0%	**1%**	**1%**
2035	5%	4%	1%	2%	3%	0%	**4%**	**3%**
2040	4%	4%	1%	1%	3%	0%	**4%**	**3%**
Midwest								
2025	0%	0%	-1%	1%	0%	0%	**0%**	**0%**
2030	1%	2%	0%	1%	0%	0%	**1%**	**1%**
2035	4%	3%	1%	2%	2%	0%	**3%**	**3%**
2040	4%	4%	1%	2%	3%	0%	**3%**	**3%**
Northeast								
2025	0%	0%	-1%	0%	-1%	0%	**0%**	**0%**
2030	1%	2%	-1%	1%	2%	0%	**1%**	**1%**
2035	3%	4%	-2%	1%	5%	0%	**3%**	**3%**
2040	3%	4%	-2%	0%	8%	0%	**3%**	**2%**
South								
2025	0%	-1%	-1%	0%	1%	0%	**-1%**	**-1%**
2030	1%	2%	0%	2%	4%	0%	**1%**	**1%**
2035	6%	5%	1%	4%	8%	0%	**4%**	**4%**
2040	5%	5%	1%	4%	7%	0%	**4%**	**4%**
West								
2025	0%	0%	0%	0%	-1%	0%	**0%**	**0%**
2030	1%	1%	-1%	0%	-1%	0%	**1%**	**1%**
2035	5%	3%	-1%	0%	0%	0%	**4%**	**3%**
2040	4%	3%	-1%	0%	0%	0%	**3%**	**3%**

Source: WICHE analysis. Notes: A positive percentage result indicates that the projections using the adjusted method were higher in number than the projections using the standard method. *Total of Public and Private Schools is the sum of the public school total produced by the adjusted 4-year ratio method and the private school total produced by the standard 5-year ratio method.

Table A-2 summarizes the total graduate projections resulting from the adjusted projection methodology, which were, on average, 3% higher by 2035 and 2040 (the years in which recent elementary enrollments move through high school) than projections produced using the standard methodology, which includes the anomalous ratios relating to the sharp dip in public school enrollments between Fall 2019 and Fall 2020. There is somewhat more variation in the results of the two projection approaches in the analysis of public school student race and ethnicity and geography. For example, lower overall rates of difference indicate that both models predict relatively similar (downward) trends for Black public high school graduate numbers based on what is computed from the enrollment numbers. Using the adjusted methodology resulted in the greatest relative difference for public high school graduates in the South.

There is often greater variability in the projections across the states and regions with smaller student populations than at the national level. However, in the case of these differences between projections from alternative methodologies, some may also relate to actual pattern variation in public school enrollment during the pandemic-affected years.

Data sources and detailed information

The historical reported counts and the projections of high school graduates in this edition of *Knocking at the College Door* rely on data accumulated over many prior years and supplemented by the most recent data obtained. This section provides specific information regarding the data sources used in this publication, detailed notes and observations about the raw data, and any adjustments made to these data.

For most state total graduates (public plus private schools), the public school portions are projected beginning 2023-24 (graduating class of 2024), while the private school portion is typically projected beginning 2021-22 (graduating class of 2022). For the class of 2021, the latest available year of private school data, public school graduates comprised 85 percent or more of the total for the nation in all but five states. Therefore, for simplicity, when writing about the projected public school graduates or a total of public and private schools, the first projected year of high school graduates is typically stated as 2023-24 (graduating class of 2024). When writing specifically about private school trends, the projections begin with 2021-22 (graduating class of 2022).

Despite these summary timeframes for which student counts are reported and confirmed and which are projected, there are state-by-state variations (and therefore related variation by region). Exceptions to these typical projection starting years are detailed in the Data Sources and Notes, and with the downloadable datasets and in the online data visualizations, where practical.

Public school enrollments and graduates

PUBLIC SCHOOL ENROLLMENT DATA

All state-level public school enrollment count data used in the projections that are new to this edition were obtained from the Common Core of Data (CCD) public data files for State Nonfiscal Public Elementary/Secondary Education Survey Data, maintained by the National Center for Education Statistics (NCES), part of the U.S. Department of Education at https://nces.ed.gov/ccd/files.asp. At the time of publication, the most recent available CCD data were for grade-level fall headcounts through SY 2022-23. The CCD public school enrollment data for school years prior to and including 2019-20 were used and published in previous editions of *Knocking at the College Door* but may not precisely match previously published values due to ongoing data quality checks or data category changes over time.

PUBLIC HIGH SCHOOL GRADUATE DATA

Data for public school high school graduates for most years from 2002-03 to 2012-13 (class of 2003 to 2013) are also from the CCD public data files (Dropout/Completers series) or as published in Digest of Education Statistics (at https://nces.ed.gov/programs/digest/) and have been included in previously published editions. As of the publication date, CCD counts for graduates from 2013-14 to 2017-18 and 2019-20 to 2023-24 have not been released. Counts for 2018-19 were released in March 2024. WICHE analyzed and utilized these newly available data for 2018-19 graduates except for selected states where WICHE had to compute proxy graduate estimates from adjusted cohort graduation rate data. In these cases, WICHE did not replace the computed estimate with the CCD value for total annual graduates because they are often different by as much as 3-5%, and using two different graduate definitions would have caused artificial patterns in the progression ratios.

WICHE has collected and compiled graduate counts data from states for the graduating Class of 2013 and all subsequent school years since the U.S. Department of Education stopped regularly releasing them in public use data files. For this edition, WICHE updated the data collection from state education departments to cover public high school graduates through 2022-23 (or the most recent year available.) The data were obtained from state websites, through public information requests, or other advertised processes for data requests; specific sources are documented in Data Sources and Notes, which accompanies all interactive charts and downloadable datasets.

WICHE takes extensive care to obtain data on the definition of high school graduates, which has been the foundation of these projections for most editions. That definition is the total number of graduates or completers in the school year who received a formal document certifying the successful completion of a prescribed secondary school program of study. This includes regular high school diplomas that are differentiated by type, such as an academic

diploma, a general diploma, or a vocational diploma (for further related education data definitions, see also https://nces.ed.gov/ccd/drpcompstatelvl.asp). Unless otherwise noted in the Data Sources and Notes, other state-recognized equivalents were not included in these counts, including recognized alternative standards often referred to as "certificates of completion," "other completers," or GED recipients.[4] In the cases where it was inconclusive which graduate types were included, the differences we observed in the data were generally within 1-2% of otherwise confirmed counts of public school graduates for the given state. While the requirements for high school graduation vary by state, these data and the trends they depict are, at least, descriptive of regular diploma recipients.

ESTIMATED TOTAL ANNUAL PUBLIC GRADUATE COUNTS

For five states, WICHE was not able to obtain specific counts of total yearly public high school graduates from the state department of education, and WICHE computed estimates of total annual graduates instead; estimates were also used for a portion of public graduates for six other states (Table A-3). These estimates are made from data published by the respective states about graduates within four to seven years of their defined ninth-grade cohort for adjusted cohort graduation rate reporting. (Note: state-published data often provide more information about adjusted cohort graduation rate (ACGR) graduates than what is made available publicly by the U.S. Department of Education, which is limited to on-time graduates within four years of ninth grade and does not provide a direct count of graduates.)[5]

States with all or some years of estimated public high school graduates 2013-14 to 2022-23:

- Arizona (all)
- Colorado (some)
- District of Columbia (all)
- Delaware (all)
- Nebraska (some)
- New Mexico (some)
- Nevada (all)
- Oregon (some)
- Vermont (some)
- Wisconsin (some)
- Washington (all)

Note: See Data Sources and Notes for state-by-state details.

The data for these estimates generally provided at least the number of on-time graduates plus the information needed to compute graduates within 5, 6, or, in selected cases, seven years of ninth grade. Estimates that stop short of graduates within 7 years of ninth grade may be systematically lower than the total annual number of graduates by a small but consistent

amount (the seven states with computed estimates that stop short of seven years past ninth grade enrolled 6% of public ninth to twelfth graders in SY 2022-23). WICHE estimates that approximately 10% of the U.S. total derives from these states' computed estimates. WICHE did not estimate potential undercounting due to data limitations, state-to-state nuance, and possible variation in the rate of potential undercounting by student race and ethnicity. Detailed notes about each state's estimates are in Data Sources and Notes.

SUPPRESSION OF SMALL NUMBERS OF GRADUATES

In relatively few cases, graduate counts for a given public school race and ethnicity series were not available – and projections are therefore not made – because the number was suppressed in the source data to protect student privacy due to small cell sizes. In some cases, the unreported graduate counts for a particular race and ethnicity might be counted in another student category. In these cases, the graduate counts that are not available for the given category are typically counted in the public school total. Also, where Native Hawaiian/Other Pacific Islander graduates are suppressed, the combined Asian/Pacific Islander and the separate Asian categories will likely have equivalent numbers of graduates. Because the region and nation graduate counts are derived from the sum of state counts, this suppression will result in the aggregated projections being incomplete by a small amount.

PUBLIC SCHOOL DATA FOR STUDENT DISTRIBUTIONS BY LOCALE

WICHE adapted its projection model to produce a preliminary, high-level illustration of future school populations by school geographic categories of city school, suburban school, town school, and rural school. This is based on the U.S. Department of Education's geographic "locale" definitions.[6] According to NCES, "a locale classification is a general geographic indicator that describes the type of area where a school is located. NCES classifies all territory in the U.S. into four types – Rural, Town, Suburban, and City, and each type is divided into three subtypes based on population size or proximity to populated areas. The classifications rely on standard urban and rural designations defined by the U.S. Census Bureau.[7] City and suburban locals are considered urban, while rural is self-explanatory. Town locations can be either urban or rural, depending on their location.

For this analysis, WICHE aggregated school-level enrollment counts from the U.S. Common Core of Data Nonfiscal Public Elementary/Secondary School Universe Survey Data Membership files (see Public School Enrollment Data section). These school-level data were aggregated by district (LEAID) and cross-walked into the locale categories using the School Locations & Geoassignments Public School Files available from https://nces.ed.gov/programs/edge/Geographic/SchoolLocations. These data were then used to produce the national projections of future student distributions by locale in the main report.

This analysis is considered exploratory and was necessarily high-level at this stage for several reasons, including that additional research will be needed to model more local projections, the school-level data may have data limitations or issues that are not present in the state-level data, and these data also evidence at a much more micro level the pandemic enrollment disruptions that are described elsewhere in this report.

Private school enrollments and graduates

PRIVATE SCHOOL UNIVERSE SURVEY

The Private School Universe Survey (PSS) is the primary data source for the private school projections. PSS is a biannual survey conducted by NCES in odd years. It provides data for public use (at http://nces.ed.gov/surveys/pss) for religious and nonsectarian private/nonpublic elementary and secondary schools in the 50 states and the District of Columbia. Private school grade-level enrollments or graduates are only intermittently available from states (see section "Private School Data Collected from States" below).

Private school enrollments used in the projections for this edition include newly published enrollment counts for 2019-20 and 2021-22, graduates for 2018-19 and 2020-21, and counts that WICHE previously published from this data source for prior years.[8] Therefore, projections of private high school graduates for most states in this edition begin with 2021-22 (class of 2022), with exceptions as outlined below or noted in Data Sources and Notes. Also, PSS only provides the total number of K-12 students by race and ethnicity and does not provide details by grade level or for graduates. WICHE cannot estimate or project the additional graduates from private schools that would add to the public school race and ethnicity series. NCES estimates the following for the distribution of race and ethnicity for private school students:

- White: 65%
- Hispanic: 12%
- Black: 9%
- Asian: 6%
- Multiracial: 6%
- Native Hawaiian/Other Pacific Islander: 1%
- American Indian/Alaska Native: 1%[9]

Because the PSS data are collected every other year, enrollment counts for grades 1 to 11 and high school graduates are typically linearly imputed by WICHE for years between PSS administrations after data review is completed. The exception is grade 12 enrollment counts, effectively provided in the PSS data for all years (survey question 9b in many years; question 8b in the 2021-22 survey).

Details concerning the PSS survey and data methodology are available on NCES's Private

School Universe Survey website (http://nces.ed.gov/surveys/pss). Of particular relevance is that the survey sampling frame comprises schools from several sources. The primary source is information initially for the 1989-90 survey, which is updated every PSS cycle by matching it with lists provided by nationwide private school associations, state departments of education, and other national private school guides and sources. Additionally, the Census Bureau conducts an area frame search each survey cycle to identify schools not included in the list frame and compensate for possible under-coverage of the list frame.

The private school estimates indicate notable variance and fluctuation in the private school sector since 2010, even after accounting for survey sampling error in the estimates. WICHE limits modifications to data except for statistically higher standard error, allowing possible real changes in the sector to carry forward, whether or not such sustained change will be borne out by subsequently reported counts.

Response rates for the PSS have historically been high but have decreased in recent years (from 92% for 2011-12, decreasing to 76% and 83% between the 2013-14 and 2021-22 administrations). Because the unweighted unit nonresponse rates of 75% for 2019-20 and 77% for 2021-22 were below NCES Statistical Standard 4-4 of 85%, PSS applied weighting adjustments to eliminate some bias. Weighted response rates were 73% for 2019-20 and 77% for 2021-22. Item response rates among responding organizations were generally higher, and in 2019-20 and 2021-22, no item-level bias adjustments were necessary.

WICHE computed state-level weighted enrollment estimates from the PSS survey response data, as has historically been done for these projections. As the PSS documentation describes, "In surveys with complex sample designs, direct estimates of sampling errors that assume a simple random sample will typically underestimate the variability in the estimates. The PSS sample design and estimation included procedures that deviate from the assumption of simple random sampling, primarily resulting from the stratified cluster sampling occurring in the area frame. The preferred method of calculating sampling errors to reflect these aspects of the complex sample design of PSS is using replication."[10] WICHE computed the estimates and used the 88 replicate weights provided with the response data to calculate sampling errors. However, the state-level graduate estimates are only available as published by PSS with the standard errors. The sampling error is expressed in terms of coefficients of variation (CV) — the ratio of the sample standard deviation to the sample mean (enrollment estimate)—at a confidence interval of 90%. WICHE typically considers a coefficient of variation of 25% or less acceptable for using survey-based estimates.

In using these data for the previous edition of these projections, WICHE observed a higher frequency of unacceptably high sample error with the private school estimates. WICHE applied the PSS program standards for estimates and suppressed estimates with CV >=50% and carefully reviewed estimates with CV 30-50% to avoid projecting forward what might be

considered data anomalies to future years. (This analysis can be found in the 10th edition Technical Appendix at https://www.wiche.edu/resources/knocking-at-the-college-door-10th-edition/.) NCES also suppresses or statistically annotates some states' graduate estimates in the published data.

WICHE did not observe a widespread higher sample error with the 2019-20 or 2021-22 data, and few or no estimates were suppressed. However, for this 11th edition of projections, some state estimates for 2013, 2015, and 2017 may differ slightly from what was previously published because the more recent data makes it possible for WICHE to impute the previously suppressed values. Therefore, some states' private school enrollment estimates may reflect a greater incidence of imputed values than is typical, given the previous suppressions for 2013-14 to 2017-18. Further, the state-level data underlie the national and regional private school estimates and may be affected to an extent by these state-level data occurrences. The instances of sample error, suppression, and imputation are documented in Data Sources and Notes.

PRIVATE SCHOOL DATA COLLECTED FROM STATES

For this edition, WICHE attempted to obtain data about private school student populations from every state's department of education to investigate the accuracy of PSS data and to inform analysis about the shifts in school-age enrollment. Additionally, WICHE considered supplementing the PSS estimates with more recent data. Ultimately, WICHE was able to obtain state data about private school enrollments, at varying levels of detail, from 32 states (data availability is unknown for some states where attempts were made, so WICHE's results should not be taken as a complete accounting for how many states maintain data about private schools).

For these states, WICHE concluded that the state-reported data about private schools were not a viable substitute for PSS data for making projections. While this non-representative sample was not robust enough to make generalized conclusions about PSS reliability or accuracy for the nation or other states, this summarizes the results from 20 states with the necessary detail to allow for comparison to the PSS data:

- For 5 of the 20 states, state data about private schools equated to about 90% of the PSS enrollment estimates (within about 10%, but lower than PSS): CA, LA, MN, NC, NJ, and NV.
- Only for NY and SD were state-reported private school data higher than PSS (NY about 10% above PSS, SD 10% or more above PSS).
- For 13 of the 20 states, the state reported private school data represented only about 65% of the PSS estimated enrollment count, and several were quite a bit lower than this average. Some potential sources of this difference are detailed below.

Even when private school enrollment counts were available with the necessary grade level

detail for comparison, virtually no states had data available about private high school graduates. Many state data sources publicize that private school enrollment data reporting is voluntary and, therefore, almost certainly incomplete. Further, varying definitions for non-public enrollments limit comparability across states or to a more uniform data source such as PSS. For example:

- Schools categorized as 'nonpublic' may include tribal or Bureau of Indian Education or include homeschooled counts under the 'nonpublic' category (e.g., homeschools with multiple children or community 'pod' schools).
- Students who have been outplaced to an approved private education provider may be represented in both public and private school data.
- Totals for 'K-12' include pre-kindergarten and kindergarten students, whereas WICHE computes grade level estimates from PSS data only for grades 1 to 12.

Limited adjustments made to reported data

WICHE carefully reviewed the data for anomalies and noted data nuances but limited any data adjustments to very few cases with apparent discrepancies (see Data Sources and Notes for specific details). The data were reviewed with the expectation that there might be some perceptible effects of enrollment shifting between public, private, and homeschooling options, as well as "real" but erratic adjustments in numbers for smaller counts. While potentially problematic for making projections, this type of anomaly was typically not considered a data error unless it was suggested by something such as an observed difference in the total public count compared to a sum of races/ethnicities.

Grand totals

In addition to the lack of data on homeschooled students in these projections (an issue discussed in greater detail in a subsequent section), two other important details should be considered for the grand totals of public and private schools.

The private school portion of the total is estimated. With the suppression necessary due to survey sampling error in the private school data (see Private School Data), it is essential to emphasize that the portion of the total that is from private schools is an estimate and conceivably less certain than the overwhelming portion that is driven by public school populations. In addition, the rapid and substantial trend shifts with private schools in recent years are not ideal for making projections. The progression methodology will mathematically carry forward recent past trends, even if the magnitude of change is not sustained over the coming 15-17 years. Also, data for private school graduates is two years behind the public school portion.

Publicly funded students attending private schools cannot be isolated in the data.

WICHE is aware of some possible duplication in the public and private school data relating to publicly funded students who attend private schools because their towns do not have public schools. Data are generally not available to de-duplicate these students. This possible duplication applies to Vermont and Maine, at least.[11] For example, by WICHE estimates, Vermont's total public and private graduate counts (and projections) might be overstated by up to 10 percent due to likely duplication of these students in the public and private school data (WICHE estimate from compiled data and correspondence with Vermont Student Assistance Commission).

Homeschool enrollment data

WICHE knows users are interested in how homeschooled children add to the projected high school graduates. At this particular time, homeschooling has become even more relevant. For context, in periods covered by previous editions of these projections, national estimates from the Parent and Family Involvement in Education (PFI) questionnaire of the National Household Education Survey (NHES) indicated that almost four percent of 5- to 17-year-olds were homeschooled (3.8 percent, 1.7 million), in 2016.[12] More recent federal research suggests that between 2018-19 and 2022-23, the population of homeschooled students ranged from 1.5 million to 1.8 million.[13] In summary, recent research indicates that homeschooled students may amount to an additional 5% or more of U.S. school-age youth not captured by the public or private school data used in these projections.

Given the growth in the number and the increased importance of homeschooling since the pandemic, WICHE thoroughly reviewed available data sources about homeschooling students but unfortunately concluded that data still do not support making projections of high school graduates from homeschooling. Not only is there a lack of uniform, comprehensive data, but what information is available suggests substantial and unpredictable fluctuation. (To include homeschooled students in the annual graduate counts or produce a projection, WICHE would need detailed data disaggregated (and not duplicated in other sources) about homeschooled students by grade level and the rate of students who complete a high school diploma.

These are key data sources that WICHE evaluated:

U.S. Census Bureau Household Pulse is an experimental data survey "to produce data on critical social and economic matters affecting American households."[14] WICHE obtained biweekly survey response and standard error tables for "School Enrollment Type for Children in Kindergarten to Twelfth Grade, by Select Characteristics", to approximate fall 2022 (weeks 49-52), and fall 2023 (weeks 60-63), from https://www.census.gov/programs-surveys/household-pulse-survey/data.html. The questions for this survey component have changed over the course of its administration — particularly to refine the definition of 'homeschooled' as distinct from other remote or virtual school options — but generally

represent, for surveyed households with children, the number of children under 18 enrolled in kindergarten through twelfth grade by the categories shown in Table A-3, which presents the U.S. estimates from this data source.

Table A-3. U.S. school enrollment estimates from U.S. Census Household Pulse

Year	Children Enrolled			Not Enrolled	Did Not Report
	Public School	Private School	Homeschooled		
2022	55.7 million 84.5%	6.7 million 10.1%	3.6 million 5.5%	20.7 million	12.3 million
2023	56.8 million 84.6%	6.6 million 9.8%	3.7 million 5.6%	21.6 million	11.5 million

Source: WICHE analysis of U.S. Census Bureau Household Pulse data. Fall 2022 and 2023 count estimates are averages of the estimates from the biweekly survey waves (coefficients of variation for underlying estimates by survey wave did not exceed 6%), and percentages represent the percent of 'enrolled' children.

These data are experimental, and users are cautioned that sample sizes may be small and the standard errors may be large. According to WICHE's analysis, all state-level estimates had coefficients of variation above 25%, indicating that the state-level data might not be reliable for state-level analysis of homeschooling. A primary limitation for comparing these estimates to school enrollment data is the lack of specificity about the age or grade level of the children in the household or enrolled (WICHE's projections research encompasses grades 1 to 12 or the equivalent, and not kindergarten or earlier childhood education, because it is not universal). This may explain differences in the relative numbers and distribution of enrolled children in these estimates compared to other data sources. The categories of children not enrolled in public, private, or homeschool and 'not reported' may also be of consequence for using and interpreting these estimates.

U.S. Census American Community Survey "Sex by School Enrollment by Level of School by Type of School for the Population 3 Years and Over" 1-Year Estimates (Table B14002).[15] WICHE evaluated the national and state estimates available from this data source but determined they were not available at the level of detail needed for projections because one category encompassed both private school and homeschooled students. Estimates were grouped by grade level (e.g., grade 1 to 4, grade 5 to 8, grade 9 to 12) and not specific grade.

State data sources. WICHE attempted to obtain data about homeschooling student populations from every state's department of education. This effort intersected with recent similar efforts by the Washington Post and the Johns Hopkins University Homeschool Hub.[16] To determine if the needed data were available for making projections, WICHE consulted the

primary sources from these other researchers and, in some cases, updated them for recency.

Ultimately, WICHE was able to compile some extent of homeschool data for 24 states for the years 2019 to 2022, plus several other states for varying years. However, for most states where data was obtained, the data lack the grade-level or age detail or the number of years of data needed for making projections, not to mention uniformity in whether the compiled data represent all homeschooling students due to variation in state registration or reporting requirements. The nature of the data also limits their usefulness for concluding whether homeschooling increases account for the unexpected decline in enrollment in public schools (and, in some states, private schools) that occurred with the pandemic. However, a high-level analysis confirms other research findings that are summarized in the main report:

- There was a surge in reported homeschool enrollment in Fall 2020, as much as a 50% increase across these 24 states in 2020.
- Reported homeschool enrollments remained above pre-2019 levels through at least 2022 by 30% across these 24 states.
- But the numeric increase in reported homeschool enrollment does not fully account for the unexpected decrease in public school enrollments, not to mention any private school enrollment decreases. In these 24 states (which accounted for about 48% of grades 1 to 12 students enrolled in public or private school in fall 2019 and 40% of the unanticipated decline in enrollments), reported homeschool enrollment increased from about 602,000 in 2019 to 895,000 in 2020. Both public and reported homeschool enrollments declined in 2021 and 2022 across these 24 states. In either or both cases, this may reflect some youth population decline along with changes in enrollment choice.

Births data

For this edition, WICHE acquired data for live births for 2020 to 2023 (enabling projections to extend through SY 2040-41) from the National Center for Health Statistics and Prevention, which is part of the Centers for Disease Control and Prevention (CDC). The data were acquired through the CDC WONDER table builder at https://wonder.cdc.gov/natality.html. Births data are grouped according to the mother's state of residence, mother's Hispanic origin, and mother's race, and added to births data used for previous editions, which WICHE has compiled over time from the CDC data source for live births in place at the time. The births data are considered final, so generally, adjustments are not made to the values obtained. Important differences between the categorization of racial/ethnic identity in the natality and education data are discussed under Considerations for the Race and Ethnicity Categories, but no adjustments were made to the births data for the projections.

U.S. Outlying areas and territories

Although WICHE was able to compile the necessary data to support projections of public school graduates for several U.S. territories, we are concerned about the overall volatility in the data — some of which is likely due to COVID-19 — and the lack of private school information, which may account for a greater proportion of the total in these locations.

Given the importance of the territories to the WICHE region—as well as the three freely associated states of the Federated States of Micronesia, the Republic of the Marshall Islands, and Palau—it is a high priority to produce usable and accurate projections in the near future. WICHE will be working to compile additional data and communicate closely with these communities to develop projections in the near future.

Considerations for the public school race and ethnicity categories

For the second time, WICHE is producing projections disaggregated by the expanded set of seven racial/ethnic categories established by the Office of Management and Budget (OMB) in 1997 for public school students and graduates. The WICHE projection method relies on the availability of at least five years' worth of uniform enrollment data, and this accumulation of data is now broadly available. Projections are now provided for public school students and graduates in these series:

- Hispanic or Latino (any race)

Among those not categorized as Hispanic or Latino:

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Two or More Races (Multiracial)

Ultimately, users should note subtle differences between the exact definitions of the race and ethnicity categorizations in any given year for the 30 years of retrospective and future data this edition encompasses. Generally speaking, data for public school students and graduates' race and ethnicity for SY 2010- 11 and all subsequent years reflect the categorizations according to the new protocol. However, data published with these projections for historical perspective, for years prior to SY 2010-11, overwhelmingly reflect the previous long-standing five racial/ethnic categories.[17] While it was possible to produce projections in this new schema, some limitations with or considerations about these varying data sources remain relevant.

NUANCES OF THE BIRTHS DATA USED FOR THE EXTENDED PROJECTIONS

Projections for 2034-35 to 2040-41 are not possible for all race and ethnicity categories.

There is not yet the necessary overlap between the births and school data to extend all the projections for all race categorizations past what can be projected from school enrollment numbers. State revisions to birth certificates to reflect the 1997 OMB standards for race and ethnicity were on different timeframes than education agencies (see https://wonder.cdc.gov/natality.html), and the complete transition to these categories is represented differently than for education data. Therefore, for now:

- Infants of Hispanic origin are categorized separately from non-Hispanic infants, and this category overlaps between the education and births data for making projections of public school Hispanic graduates through SY 2040-41. (Nonetheless, the quasi-cohort matching between the data sources is still imperfect because births are categorized based only on the mother's Hispanic identity).
- WICHE produces separate projections for public school Asian graduates and Native Hawaiian/Other Pacific Islander graduates only through SY 2033-34. The combined category of Asian/Pacific Islander is projected through SY 2040-41 because data for this category is similarly available from both births and school data.
- The births data do not support extended projections for multiracial public school graduates; projections are only made through SY 2033-34. However, not having values for this series in the extended years would make the total of public high school graduates, when viewed by race and ethnicity, incomplete. Therefore, WICHE also issues approximations of the number of multiracial public high school graduates for SY 2034-35 to SY 2040-41 (this estimate is a simple continuation of their share of non-Hispanic graduates by SY 2033-34). However, users should understand that these approximate values should not be added to the other races/ethnicities in these outer years because they would introduce some inherent duplication.
- Over the years encompassed by this edition, the births data for the remaining non-Hispanic race categories are now provided in the source data in two slightly different and non-overlapping categorization schemas: what are considered "bridged" race categories through birth year 2016 (which includes methodologically assigning infants of multi-race origins to a single category of White, Black/African American, American Indian/Alaska Native or Asian/Pacific Islander); and single-race categories for birth years past 2016.[18] Subtle differences between these schemas are not ideal for longitudinal time series data and may introduce some unknown level of 'noise' in making projections.[19]

Other effects of births and school data differences. The projection method invokes recent births to project the number of first graders for 5-6 years after the last reported year of 1st-grade enrollments. This is done using the five-year weighted average ratio of the number of first graders compared to infants born approximately six years prior for the five most recent years. Theoretically, something very close to 100 percent of children born will enter first grade within six years, but WICHE observes ratios above and below 100 percent. There could

be many reasons why there might be more or less than 100 percent of infants appearing in first-grade counts. The ratio of births to first graders has always been subject to some level of effect from interstate relocations, immigration, changes in race and ethnicity categories, early and late enrollment of first graders, homeschooling, and enrollment in private schools (which do not provide race and ethnicity detail), and the small but non-negligible rates of childhood mortality.

But in recent years, WICHE has observed increasingly disparate ratios of state births to first-grade enrollments that we suspect relate to the known differences in race and ethnicity categorizations described above. For this reason and the limitations of the births data for making the extended projections, for the 10th edition, WICHE assessed the possibility of using another data source to model the longer-term projections (population estimates by age and race and ethnicity from the U.S. Census Bureau American Community Survey (ACS) public use microsample data (PUMS). However, these data are not an equal substitute for the births data for making the extended projections in the detail that WICHE produces the projections. The primary purpose for considering an alternative to births data was to gain precision with the state-level progression ratios by student race and ethnicity. However, it was only possible to produce fewer than half of the necessary single-year age estimates by race and ethnicity by state due to depletion from standard error (it was a similar case for multiple-year age estimates, e.g., combined 5- 6-year-olds). Also, due to the nature of the ongoing ACS data collection, it is not possible to construct an equivalent definition of single-year age estimates in a given annual period that corresponds with the school year, similar to what is anticipated with the progression methodology (e.g., micro age estimates are produced from ACS "5-year" datasets). (Projections by other researchers have illustrated the limitations and benefits of the data for various geographic groupings).[20]

Lacking a substitute for the births data for the extended projections, WICHE carefully reviewed the projections for SY 2034-35 to 2040-41 for overt over- or under-estimation of underlying population changes but generally did not alter or restrict the projections. Possible inflation/deflation is most likely or apparent with smaller states and races and ethnicities.

TOTAL AMERICAN INDIAN/ALASKA NATIVE GRADUATES ACROSS PUBLIC SCHOOLS AND BUREAU OF INDIAN EDUCATION SCHOOLS

WICHE does not find the precise data needed to account for the additional number of American Indian graduates there would be if students from Bureau of Indian Education (BIE) schools were accounted for but provides estimates in the main report (see section on Additional American Indian High School Graduates from Bureau of Indian Education Schools).

Projection accuracy

WICHE endeavors to ensure that the *Knocking at the College Door* methodology remains a credible

and reliable method for producing these projections. This includes consulting with experts for each edition, assessing the accuracy of the projections against the subsequently reported actual data and other education projections, and carefully inspecting the underlying data and other pertinent information. Furthermore, WICHE releases updated projections on average every four to five years. This is a relatively short period of time, considering that student populations and trends are relatively stable, and the projections are, therefore, reliably contemporaneous.

WICHE has reviewed the reliability of the methodology twice, in 1993 and 2012. The 2012 methodological review remains relevant and is summarized in a report including the commissioned technical white paper, a simulations analysis to compare the relative accuracy of several CSR alternatives, and two expert review panels — both a technical review panel of experts and an end-user panel of various experts who use *Knocking at the College Door*.[21] In the 2012 review, the CSR methodology was found to produce projections as well as or better than the two most feasible existing alternatives (single and double exponential smoothing), to accommodate the constraints of the available data, and to provide the transparency and clarity that give the projections their substantial credibility.

Of course, this edition of projections includes significant enrollment disruptions, as discussed in the report and the section in this appendix, "11th Edition Methodology Adjustment for Recent Anomalous Enrollment Patterns." Instead, this section discusses WICHE's efforts to ensure the overall, long-term integrity of the projections.

During the course of preparing this edition that presents unique methodological challenges, WICHE consulted selected demographic and educational experts and stakeholders, including from the organizations Georgetown Center for Workforce and Education, National Center for Educational Statistics, National Center for Higher Education Management Systems, College Board, the National Association of Independent Schools; in addition, WICHE shared this information with a variety of other education experts and stakeholders and received their general feedback on the trends and relevant issues.

MEAN ABSOLUTE PERCENTAGE ERROR

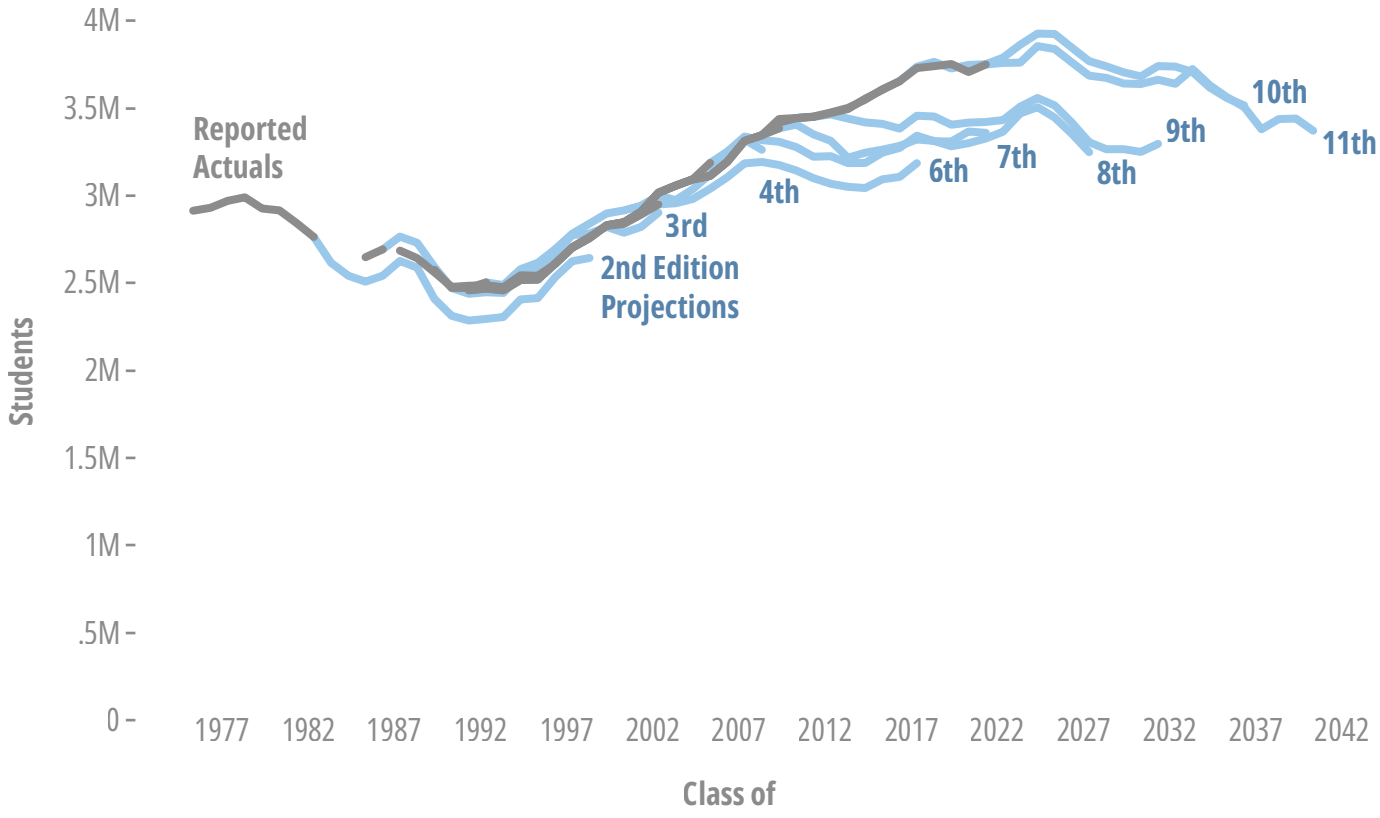
WICHE has analyzed the relative accuracy of the *Knocking at the College Door* projections at different periods of time for as many editions as possible through the last (10th) edition, compared to the compiled reported actual graduate counts. The mean absolute percentage error is one way to express the forecast accuracy of past projections, summarizing the differences between past projections and actual data.[22] As shown in Table A-4, the mean absolute percentage errors for WICHE's projections of total and public high school graduates in the United States for lead times of 1, 2, 5, and 10 years were 1%, 1% (total) to 2% (public), 3%, and 7%, respectively, over seven editions of the projections.

Table A-4. Mean absolute percentage errors, selected lead time in years

Year	Public & Private School Graduates	Public School Graduates
Year 1	1%	1%
Year 2	1%	2%
Year 3	2%	2%
Year 5	3%	3%
Year 10	7%	7%

Figure A-3 illustrates how the projections have compared to subsequently reported high school graduates and the overall trajectory of high school graduates from both projections and subsequently reported actuals.

Figure A-3. Over time: The projections track reported total high school graduates (projections from* Knocking at the College Door*, 1979 to 2041)



Source: WICHE summary of *Knocking at the College Door* projections from multiple published editions. Note: Projections are not digitally available for all editions.

Below the national level, there is greater variance for some regions and states, but it does not appear to be systematic or systematically related to the methodology. It is also relevant to quantify the projections' accuracy over time by race and ethnicity, but for multiple reasons, it is less possible or meaningful. First, WICHE has been producing these projections for fewer editions than the totals, providing fewer points of comparison over time. But a key complication is the substantial definitional nuances and changes with the underlying data over time, both within data sources and across data sources (for example, births data compared to school enrollments). All of this leads to expected imprecision between the projected numbers of high school graduates by race and ethnicity and the ultimately reported number.

COMPARISON TO OTHER EDUCATION DATA

The MAPE analysis will be, to some extent, somewhat self-referential because it does not include comparable data about the number of high school graduates independent of the data that underlie the projections. It can, therefore, be difficult to attribute differences to the projection methodology precisely rather than differences arising from, for example, data definitions or reliability of survey estimates.

However, one point of comparison is the U.S. Department of Education's published projections. While NCES uses a different cohort progression methodology (single exponential), the published NCES projections of U.S. high school graduates are within one percentage point of WICHE's projections over the first five projected years (through 2027-28) and 2.3 percentage points by the last comparable year (2031-32). Both NCES and WICHE project a peak of 3.86 to 3.87 million graduates in the class of 2025.[23]

These NCES projections are in some groupings similar to WICHE's projections and also report mean absolute percentage errors. For example, from the most recent NCES projection report, the mean absolute percentage errors for U.S. public school graduates for lead times of 1, 2, 5, and 10 years were 1.0, 1.1, 2.5, and 5.1 percent, respectively, and for U.S. private school graduates, 3.0, 2.2, 10.4, and 12.8 percent, over multiple editions of the NCES projections.[24] This is perhaps noteworthy since the WICHE data sources depart from the NCES Common Core of Data source, but still confirms similar trends.[25]

Expected differences between national, regional, and subgroup projections

WICHE makes lower-level projections independent of the aggregate projections. The primary reason for this is to let possibly legitimate growth trends that are seen at the lower levels be evident; they might be overstated or understated if they were adjusted. The small numerical differences that result from making these projections independently may cause confusion for some users of these projections. Generally speaking, the differences between the independently projected series tend to increase in later years, consistent with the nature

of extended projections. These differences are expected to be more evident in series with smaller numbers.

In this edition of projections, these differences may be complicated by the public school enrollment disruption that varies across the states and by race and ethnicity. In previous recent editions, the difference between the sum of the states and the regional total graduate projections was between one-half and one percent in later projected years, with select higher variation by region or private school series. The maximum differences observed in the sum of the state's race and ethnicity projections compared to the national projection for that race and ethnicity was 3.5% with the American Indian/Alaska Native and Asian/Pacific Islander series (9th edition).

Implicit and environmental influences on the projections

Demographic studies generally identify two primary sources of population change: natural increase and net migration.[26] The number of school-age youth – and, eventually, high school graduates – is influenced first and foremost by the number of children born and secondarily by factors such as grade retention and acceleration, net migration between states and school sectors, dropouts, early graduations, mortality, significant events, policies, and practices.

The cohort survival ratios that are used to generate the projections capture these factors implicitly through the recent past counts of infants, students, and graduates and carry them forward into the future projected years. However, this assumption has the greatest potential to degrade the accuracy of the projections should either a new pattern emerge in the preceding year or two (which is precisely what WICHE responded to for this edition of projections by adjusting the base methodology), or new circumstances arise in reality that are not evident in the years of available data (such as if fall 2023 or fall 2024 enrollment numbers eventually indicate a return to pre-pandemic enrollment patterns).

The overwhelming influence of fertility patterns on the future number of high school graduates and the contribution of family movements between states and in and out of the country are discussed in the main report. Mortality, grade retention (holding students back), and grade acceleration (promoting students early) impact enrollments and grade progression to varying extents and can vary systematically by race and ethnicity.[27] While these factors are not explicitly modeled in the projections, they are implicitly included in the calculated cohort survival ratios that reflect the various aspects of grade progression. As discussed in the report, these historically more subtle factors might have increased relevance to projections given the evidenced pandemic learning impacts. At the same time, as factors, they may have become less discernible in headcount data, given the sheer numeric enrollment changes related to population decrease and school choice. Interested readers can find more details about such topics in WICHE's 2012 *Methodology Review Report*.[28]

Natural disasters such as hurricanes, tornadoes, and wildfires can have a real impact at a state and local level, disrupting families and school operations, sometimes to an amount discernible in fall enrollment numbers as families and communities recover over time or, in some cases, resettle. Previous editions of these projections have evidenced some of this effect at a state level (e.g., hurricanes Katrina, Harvey, Irma, and Maria).

Other impacts on future graduation may be evidenced in number and trend changes relating to educational policies such as dual and concurrent enrollment, state standards for instruction, the adoption of new technology or assessments, state and federal education tax and savings policies, school choice, and state graduation standards. Each of these has been discussed and documented in previous editions of *Knocking at the College Door*.

Several major natural disasters have impacted various parts of the nation, and a range of educational policies have evolved in the period covered by data used in this edition of projections (2020 to 2022), and others have occurred in real-time past the available data (2023 and 2024). However, their implicit influence is presumably reflected in the available data, and WICHE has not attempted to isolate potential effects from the other significant enrollment fluctuations discussed in the report.

ENDNOTES

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3 WICHE limited possible alternatives to those most closely related to the base 5-year weighted average ratio methodology but recognizes other projection methodologies such as single or double exponential may also be suitable alternatives.

4 Recipients of national high school equivalency assessments are not included in the count of high school graduates unless the primary (state) data source did not allow for excluding them.

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17 All references to students by race and ethnicity refer to public school students only. A small number of states began reporting in the new seven categories in school year 2008-09 or 2009-10 and are most evident when looking at the data at a state level but not as apparent in regional and national views of the data.

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23 National Center for Education Statistics, 2024.
24 National Center for Education Statistics, 2024.
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