Arizona July 1, 2021 Population Estimates – Methodology

County Estimates

Group Quarters (GQ) population is estimated in the following steps:

1. Establish the total GQ population in each place (incorporated place or unincorporated balance of county) as of Census 2020;
2. Track the GQ population of major facilities annually starting April 2020 and for each subsequent July;
3. Find the change in GQ population in these facilities between April 2020 and the estimate year (2021). If data is missing for either April 2020 or for the estimate year, then that record is not used in calculating the change;
4. Estimate GQ population of each place by adding numbers from Step 1 and Step 3;
5. The sum of GQ populations of all places within a county is the GQ population estimate for that county.

Two separate methods are used to produce estimates of household population for counties.

1. Forecast method:
   a. Using intercensal estimates between 1980 and 2019 and the revised estimates for 2020 as input, SPSS forecasting models are run to produce short-term projections for July 1, 2021 for each county. SPSS has a built-in "Expert Modeler" that analyzes the input data and automatically determines what model (among several forecasting models) is best suited for the data. The Expert Modeler is enabled.
   b. The group quarters (GQ) population of each county is subtracted from the estimated total population to obtain the estimated household population.
2. Housing unit method (HUM):
   a. Start with the Census 2020 housing units, household population, persons per housing unit, and Group Quarters population, for each sub-county jurisdiction.
   b. Determine the July 1, 2021 housing unit stock by adding cumulative completions or building permits between Q2 2020 and Q2 2021 to the Census 2020 housing stock. For permits, a six-month lag is assumed for single-family units and 2-to-4-unit buildings; a 12-month lag is assumed for 5-plus-unit buildings. It is assumed that 98% of permits are built. Mobile homes are assumed to be in place the same quarter they are permitted with a 100% placement rate. Find the number of demolitions for the entire period and subtract them from the housing stock.
   c. Pre-annexation household population is calculated by multiplying the new housing unit stock by census persons per housing unit.
   d. For annexations that contain housing units, the actual number of occupants is determined from field information. If that is not possible, census block-level information is used. The corresponding numbers of housing units and persons are subtracted from the jurisdiction that de-annexed the housing units. Because the 2020 Census uses the boundary as of January 1, 2020, it is determined that Q1 2020 annexations need to be included in this calculation.

      e.   Adding up the numbers from steps c and d results in the unconstrained household population for each jurisdiction; this is summed up at the county level.

A hybrid method is used to determine the estimated household population. For most counties, the two methods produce very close estimates of household population. The greater estimate between the two methods is chosen as the household population control at the county level.

Sub-county Estimates

The county's HUM household population is then divided into the household population control obtained from the step above to yield a "control factor" for each county.

The control factor is multiplied by the unconstrained household population estimate of each sub-county jurisdiction to get the "controlled" household population estimate.

Sub-county estimates are then finalized by adding the GQ population at the jurisdiction level.