



2014 POPULATION FILE FOR USE WITH AHRQ QUALITY INDICATORSTM Version 5.0

Prepared for:

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Contract No. HHSA290201200001C

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March 2015

Contents

1.0 Overview	2
2.0 Data and Methodology	3
2.1 Census Data Files	3
2.1.1 Notable Differences in Population Estimates From 2000 Census to 2010 Census	5
2.1.2 Modifications to Census Estimates for Use in the Population File	5
2.1.3 Census Data File Mapping to AHRQ QI Population File	6
2.2 Version History	6
3.0 Population File Specification	8

List of Tables

Table 1. AHRQ QI Area-Level Indicators	2
Table 2. Census Dataset Descriptions and Sources	4
Table 3. Race Category Aggregations Based on Census Reporting Categories	5
Table 4. Population Files Used With Various Versions of AHRQ QI Software	7
Table 5. Data Fields in POP95T14.txt	8

1.0 Overview

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators (QIs)™ include 36 area-level indicators (Table 1). These indicators are intended to measure health care quality across the population in a geographic area rather than for a single facility or provider. With a few exceptions, as noted in Table 1, the denominators for area-level indicators are the population of the area being examined, subset by age or (for some indicators) by gender. The denominators for these indicators must be constructed from an outside source rather than drawn from a subset of discharges in the user’s input file.

The objective of this document is to describe how the population data estimates are derived from public use Census data for use with the QI SAS® v5.0 and QI Windows® Software Version 5.0 (WinQI v5.0). Population figures through 2014 for use with SAS QI v5.0 are provided in the file POP95T14.txt, available as a separate download on the AHRQ QI Web site (<http://www.qualityindicators.ahrq.gov/Software/Default.aspx>). Population data is built into the installation package for WinQI v4.6 and v5.0.

Table 1. AHRQ QI Area-Level Indicators

IQI 26 Coronary Artery Bypass Graft (CABG) Rate	PQI 10 Dehydration Admission Rate
IQI 27 Percutaneous Coronary Intervention (PCI) Rate	PQI 11 Bacterial Pneumonia Admission Rate
IQI 28 Hysterectomy Rate	PQI 12 Urinary Tract Infection Admission Rate
IQI 29 Laminectomy or Spinal Fusion Rate	PQI 13 Angina Without Procedure Admission Rate
PSI 21 Retained Surgical Item or Unretrieved Device Fragment Rate	PQI 14 Uncontrolled Diabetes Admission Rate
PSI 22 Iatrogenic Pneumothorax Rate	PQI 15 Asthma in Younger Adults Admission Rate
PSI 23 Central Venous Catheter-Related Blood Stream Infection Rate	PQI 16 Lower-Extremity Amputation among Patients with Diabetes Rate
PSI 24 Postoperative Wound Dehiscence Rate	PQI 90 Prevention Quality Overall Composite
PSI 25 Accidental Puncture or Laceration Rate	PQI 91 Prevention Quality Acute Composite
PSI 26 Transfusion Reaction Rate	PQI 92 Prevention Quality Chronic Composite
PSI 27 Perioperative Hemorrhage or Hematoma Rate	PDI 14 Asthma Admission Rate
PQI 01 Diabetes Short-Term Complications Admission Rate	PDI 15 Diabetes Short-Term Complications Admission Rate
PQI 02 Perforated Appendix Admission Rate*	PDI 16 Gastroenteritis Admission Rate
PQI 03 Diabetes Long-Term Complications Admission Rate	PDI 17 Perforated Appendix Admission Rate1
PQI 05 Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate	PDI 18 Urinary Tract Infection Admission Rate
PQI 07 Hypertension Admission Rate	PDI 90 Pediatric Quality Overall Composite
PQI 08 Heart Failure Admission Rate	PDI 91 Pediatric Quality Acute Composite
PQI 09 Low Birth Weight Rate*	PDI 92 Pediatric Quality Chronic Composite

*These indicators use discharge data from the input data file to estimate the denominator rather than demographic data from the population file.

2.0 Data and Methodology

Every year, (as of July 1) the Census Bureau releases postcensal population estimates¹ (that are generated with the assistance of the Federal-State Cooperative Program for Population Estimates using residence, total births, total deaths, and net migration. With each new issue of July 1 estimates, the Census Bureau makes revisions to all years back to the last decennial census. Each decade, after a decennial census, the Census Bureau produces a set of intercensal estimates that provide annual population estimates that are adjusted to smooth the transition from one decennial census to the next. These estimates are used to derive the AHRQ QI Population File to be used with the AHRQ QI software.

2.1 Census Data Files

Public use files of intercensal and postcensal estimates of county-level population by 5-year age group, sex, race, and Hispanic origin were acquired from the Census Bureau (<http://www.census.gov/popest/>) covering the years 1995 through 2013. Table 2 presents detailed information and sources for the specific files acquired and used to generate the POP95T14.txt file for use within the AHRQ QI software.

¹“Estimates are for the past, while projections are based on assumptions about future demographic trends. Estimates generally use existing data collected from various sources, while projections must assume what demographic trends will be in the future.” (<http://www.census.gov/population/www/projections/aboutproj.html>)

Table 2. Census Dataset Descriptions and Sources

DATA NAME	YEARS	BASE DECENNIAL YEAR	TYPE	SOURCE
Intercensal estimates of the resident population by 5-year age groups, sex, race, and Hispanic origin for counties	2010–2013	2010	Intercensal	http://www.census.gov/popest/data/counties/asrh/2013/CC-EST2013-ALLDATA.html
Intercensal estimates of the resident population by single year of age and sex for States and the United States	2000–2010	2010	Intercensal	http://www.census.gov/popest/data/intercensal/
State single year of age and sex population estimates	2010–2013	2010	Postcensal	https://www.census.gov/popest/data/state/asrh/2013/SC-EST2013-AGESEX-CIV.html
State and county intercensal estimates by demographic characteristics	1990–1999	2000	Intercensal	http://www.census.gov/popest/data/intercensal/st-co/characteristics.html

2.1.1 Notable Differences in Population Estimates From 2000 Census to 2010 Census

There are four counties that existed for the 2000 Census but not for the 2010 Census (<http://www.census.gov/2010census/>)

- 02201: Prince of Wales–Outer Ketchikan Census Area, AK
- 02232: Skagway-Hoonah-Angoon Census Area, AK
- 02280: Wrangell-Petersburg Census Area, AK
- 51560: Clifton Forge city, VA

In the 2010 Census, the populations from these four counties are distributed to other surrounding counties. The result is that the POP95T14.txt file contains estimates for these four defunct counties for the years 1995–1999, and the estimates for the years 2000–2014 are listed as “0” since they are based on 2010 Census county boundaries.

2.1.2 Modifications to Census Estimates for Use in the Population File

Modifications to the Census estimates were required to fit the specifications of the AHRQ QI software. The first is the categorization of race and Hispanic origin. Table 3 depicts how the race categories used by the AHRQ QI software were defined from the census race and Hispanic origin groupings. This set of race categorizations captures the entire U.S. population.

Table 3. Race Category Aggregations Based on Census Reporting Categories

RACE CATEGORY	DESCRIPTION
1	Non-Hispanic, White Alone
2	Non-Hispanic, Black Alone
3	Hispanic
4	Non-Hispanic, Asian Alone OR Non-Hispanic, Native Hawaiian and Other Pacific Islander Alone
5	Non-Hispanic, American Indian and Alaska Native Alone
6	Non-Hispanic, Two or More Races

In addition, the population of interest for the area-level indicators in the Pediatric Quality Indicators module is the population ages 17 and under, while the population of interest for the other indicator modules is the population ages 18 and older. The default 5-year age groups reported by the Census Bureau are 15–19 years of age and 20–24 years of age. To capture the separation between the pediatric and adult populations, the POP95T14.txt file contains an age range that spans the ages of 18–24 that is constructed using the two default census age groups. To generate the 18- to 24-year-old age group, State-level estimates of population by sex and single year of age (see Table 2) were used to calculate the percent of the population between 15 and 19 years old (the age grouping for the county-level data) that are between 18 and 19 years old. Then, the county-level population of 18- to 19-year-olds was subtracted from the Census-defined age group of 15–

19 (to form the 15- to 17-year-old age group) and added to the 20- to 24-year-old age group (to form the 18- to 24-year-old age group).

2.1.3 Census Data File Mapping to AHRQ QI Population File

The POP95T14.txt file population estimates for 1995 through 1999 are based on intercensal estimates by demographic characteristics (Table 2). Since these data are adjusted to the 2000 Census, they are no longer updated by the Census Bureau with more recent postcensal estimates and the estimates remain unchanged from version to version release of the AHRQ QI software.

The POP95T14.txt file population estimates for 2000 through 2010 are based on intercensal estimates by demographic characteristics that are adjusted to the 2010 Census. The POP95T14.txt file population estimates for 2011–2013 are based on postcensal estimates by demographic characteristics that use the 2010 Census as the base.

Public use files of postcensal population estimates from the Census Bureau are currently available only through 2013. The POP95T14.txt file contains population estimates for 2014 based on linear projections of the population counts for each county, sex, age group, and race combination. The projections were made according to the following model:

$$\hat{y}_{ijt} = \hat{\alpha}_{ij} + \hat{\beta}_{ijt}$$

where “i” is the county (1, 2, ..., 3147), “j” is an indicator of demographics representing a combination of sex, age group, and race (1, 2, ..., 216), and “t” is the year (2000, 2001, ..., 2013). That is, the county-specific linear growth model for each demographic group. The population estimates for each county and demographic combination, “y,” for 2014 were calculated using the following equations:

$$\hat{y}_{ij2014} = \hat{\alpha}_{ij} + \hat{\beta}_{ij2014}$$

where $\hat{\alpha}_{ij}$ and $\hat{\beta}_{ij2014}$ are the coefficients estimated from the linear regression models.

2.2 Version History

The population file released with each version of the software is generated with the most recent data available at the time of software development. As such, this file will change from version to version (including the file name) as data are updated and released by the Census Bureau. The differences between population files for AHRQ QI software release versions can be caused by changes in population estimates themselves and/or changes in methodology. Table 4 summarizes the population files for AHRQ QI software release versions. Note that data for population files included with previous releases of the AHRQ QI software are not updated with each new release.

Table 4. Population Files Used With Various Versions of AHRQ QI Software

SOFTWARE RELEASE (FILE NAME)	YEARS	BASE DECENNIAL YEAR	DATA SUMMARY	METHODOLOGY SUMMARY
v5.0 (POP95T14.TXT)	Estimates: 1995–1999	2000	(1) Sex/age/race by county (2) Ages 18–24 by State	<ul style="list-style-type: none"> • Permuted file of sex/age/race by county • Used State estimate of population from 18–24 to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups
	Estimates: 2000–2013 Projections: 2014	2010	(1) Age/sex/race by county (2) Age (single year) by State	<ul style="list-style-type: none"> • Permuted file of sex/age/race by county • Used State estimate of single year of age to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups
v4.5 (POP95T13.TXT)	Estimates: 1995–1999	2000	(1) Sex/age/race by county (2) Ages 18–24 by State	<ul style="list-style-type: none"> • Permuted file of sex/age/race by county • Used State estimate of population from 18–24 to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups
	Estimates: 2000–2011 Projections: 2012–2013	2010	(1) Age/sex/race by county (2) Age (single year) by State	<ul style="list-style-type: none"> • Permuted file of sex/age/race by county • Used State estimate of single year of age to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups
v4.4 (POP95T12.TXT)	Estimates: 1995–1999	2000	(1) Sex/age/race by county (2) Ages 18–24 by State	<ul style="list-style-type: none"> • Permuted file of sex/age/race by county • Used State estimate of population from 18–24 to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups
	Estimates: 2000–2010 Projections: 2011–2012	2010	(1) Sex/age by county (2) Sex/race by county (3) Age (single year) by State	<ul style="list-style-type: none"> • Combined sex/age and sex/race files by county to get estimates of sex/age/race • Used State estimate of single year of age to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups
v4.3 (POP95T11.TXT)	Estimates: 1995–2009 Projections: 2010–2011	2000	(1) Sex/age/race by county (2) Ages 18–24 by State	<ul style="list-style-type: none"> • Permuted file of sex/age/race by county • Used State estimate of population from 18–24 to break 15–19 and 20–24 age groups into 15–17 and 18–24 age groups

3.0 Population File Specification

The POP95T14.txt file is an ASCII-based text file containing 679,752 records with a fixed logical record length of 150 bytes. It is in fixed column format. Table 5 presents the file’s specific fields and the code schema used for each field.

The file is structured for use with AHRQ QI programs PQSASA2.SAS, PQSASA3.SAS, PSSASA2.SAS, IQSASA2.SAS, IQSASA3.SAS, PDSASA2.SAS, and PDSASA3.SAS as well as the WinQI software. As such, any modification to this file will affect the operation of these programs.

A given county is identified by the Federal Information Processing Standards (FIPS) code for the State in which it is located and by the county’s FIPS code. For each county within the United States, the file contains 216 records: a record for each unique combination of gender, 18 age groups, and 6 race groups. Each physical record represents a gender, age group, and race group combination for that county and contains population estimates (rounded to integer values) for that combination for each year from 1995 through 2014.

The file has data for 3,147 counties or “equivalent areas,” defined to constitute primary divisions of their States. “Equivalent areas” include the independent cities of Baltimore, MD; St. Louis, MO; Carson City, NV; and 39 independent cities in Virginia. Because they are independent of any contiguous county, they are treated as separate counties with their own population records. Population figures for surrounding counties exclude them. Differences in the record count from previous population files are due to changes in county definitions or equivalent areas. Definitions for State and county FIPS codes can be found at http://quickfacts.census.gov/qfd/meta/long_fips.htm.

Table 5. Data Fields in POP95T14.txt

FIELD	VARIABLE	COLUMN POSITION	FORMAT	CODES
1	State	1–2	Zero filled numeric	FIPS code
2	County	3–5	Zero filled numeric	FIPS code
3	Sex	7	Numeric	1=Male, 2=Female
4	Age Group	9–10	Numeric	1=0–4 years 2=5–9 years 3=10–14 years 4=15–17 years 5=18–24 years 6=25–29 years 7=30–34 years 8=35–39 years 9=40–44 years 10=45–49 years 11=50–54 years

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FIELD	VARIABLE	COLUMN POSITION	FORMAT	CODES
				12=55–59 years 13=60–64 years 14=65–69 years 15=70–74 years 16=75–79 years 17=80–84 years 18=85+ years
5	Race	12	Numeric	1=White 2=Black 3=Hispanic 4=Asian & Pacific Islander 5=American Indian 6=Other
6	1995 Population	13–19	Numeric	Integer totals
7	1996 Population	20–26	Numeric	Integer totals
8	1997 Population	27–33	Numeric	Integer totals
9	1998 Population	34–40	Numeric	Integer totals
10	1999 Population	41–47	Numeric	Integer totals
11	2000 Population	48–54	Numeric	Integer totals
12	2001 Population	55–61	Numeric	Integer totals
13	2002 Population	62–68	Numeric	Integer totals
14	2003 Population	69–75	Numeric	Integer totals
15	2004 Population	76–82	Numeric	Integer totals
16	2005 Population	83–89	Numeric	Integer totals
17	2006 Population	90–96	Numeric	Integer totals
18	2007 Population	97–103	Numeric	Integer totals
19	2008 Population	104–110	Numeric	Integer totals
20	2009 Population	111–117	Numeric	Integer totals
21	2010 Population	118–124	Numeric	Integer totals
22	2011 Population	125–131	Numeric	Integer totals
23	2012 Population	132–138	Numeric	Integer totals
24	2013 Population	139–145	Numeric	Integer totals
24	2014 Population	146–152	Numeric	Integer totals