Population Projections

Introduction to DAPPS

DAPPS is developed by the U.S Census Bureau, with funding from the U.S. Agency for International Development
What is DAPPS?

- Demographic Analysis and Population Projection System
- User-friendly system for creating population projections
- Ultimate goal is to combine the demographic analysis and population projection work into one integrated system
What is DAPPS?

- Currently DAPPS is a user-friendly system for entering data for population projections
- Currently uses RUP in the background to create projections
- In the process of integrating the functionality of some of the Population Analysis System workbooks
- Ultimately, the projection engine will be rewritten as an integral part of the system
- Subnational capabilities will also be integrated
RUP History

- Created in 1980s
- Uses “card-image” inputs
- Less user-friendly than other programs
  - Inputs must be properly formatted
  - Inputs must be in proper sequence
- Formatting inflexibility offset by
  - Input types and quantities allowed
  - Generated output types and quantities
For more information on the projection methodologies of DAPPS and RUP, see the RUP User’s Guide.
DAPPS/RUP is a One-One Projection Program

- One-one cohort-component projection moves population defined by single years of age forward one year at a time. Inputs may be for 5-year or single-year age groups.

- In contrast:
  - Five-five projection moves population defined by 5-year age groups forward 5 years at a time. Inputs are for 5-year age groups.
  - Five-one projection also moves population defined by 5-year age groups forward 5 years at a time then splits the projected population’s age groups into single years.
Comparison of USCB and UN estimates of Burundi IMR

5-year average projections (United Nations)

Versus

Single-year intervals (Census Bureau)
DAPPS/RUP Input Requirements

- To create a projection, DAPPS/RUP requires at least 3 components:
  - A base population, by age and sex (usually based on a census or estimate);
  - A mortality structure, by age and sex (usually a life table or deaths, by age and sex); and
  - A fertility structure, by age of mother (births or age-specific fertility rates).

- Since populations likely experience inflow and outflow of persons, a fourth component is optional but recommended:
  - A pattern of net migration (by age and sex of migrant).

- A projection can be completed without migration; net migration is assumed to be zero.
DAPPS/RUP Input Requirements

- DAPPS/RUP assumptions
  - Projection: midyear to midyear
  - Rates and Events are for calendar years.
- Base year population
  - Single years of age or 5-year age groups
  - If 5-year age groups, RUP splits into single years
- Inputs NOT required for each year of projection
- Levels interpolated or held constant for years without inputs
DAPPS/RUP Input Requirements

- Inputs must be accurately dated
- Inputs must refer to single calendar years rather than to periods of 5 years
DAPPS/RUP Allocates Calendar Year Events Evenly Over the Year

DAPPS/RUP Interpolation/Extrapolation of Input Data

DAPPS/RUP Output

- Output population is for midyear
- Output measures of fertility, mortality, migration are for calendar year
- Available output:
  - Single-year, five-year, and irregular age groups for population, migration, and deaths
  - Single-year and five-year age-specific fertility rates
  - Abridged and unabridged life tables
DAPPS/RUP Output

- Outputs match inputs
- Parameters controlled by user:
  - Number of projection years
- Progressive rounding maintains consistency among values created by the program
  - Rounding to integer values occurs in:
    - Population, deaths, and migrants by single years of age and sex
    - Births by single years of age of mother
- See RUP User’s Guide, p. 85
DAPPS Projection Inputs

- The data for these components can come from one of two places:
  - A RUP input file or,
  - A spreadsheet-based program, like Microsoft Excel or MortPak for Windows.

- To create your own projection, you first need to create a new Portfolio or open an existing one.
DAPPS Portfolios

- The DAPPS “portfolio” is a directory that contains subdirectories and all the files needed by DAPPS for storing data and doing projections.
- The portfolio name is also used for the DAPPS file that is used to identify a portfolio. So the portfolio named “TEST” would be a directory called “TEST” and would include the file TEST.dapps.xml.
Create a New Portfolio: DAPPS 2.0

- File → New → Portfolio
Create a New Portfolio: DAPPS 3.0

- File → New Portfolio
Create a New Portfolio

- Choose a Location
- Enter a Name (this will become a subdirectory under Location)
- Click on the “Create” button
To open an existing portfolio, select “Open” from the File menu and navigate to portfolio, or select one of your recently-created portfolios from the bottom of the file menu.
To open an existing portfolio, select “Open” from the File menu and navigate to portfolio, or select one of your recently-created portfolios from the side of the file menu.
Import from RUP: DAPPS 2.0
Import from RUP: DAPPS 3.0
Import from RUP
Import from RUP

- If one or more data components were not imported, please check your input file for formatting errors and try again.
Add New Data: DAPPS 2.0

- File → New → Data Input...

- Or on the toolbar
Add New Data: DAPPS 3.0

- File → New Data Input…

![Image of DAPPS 3.0 interface with New Data Input option highlighted.](image-url)
Add New Data: DAPPS 3.0

- Or, Input → Right click → Add New
Add New Data: Population Example

- Select
  - Data Type
  - Data Format
  - Age Grouping
  - Max Age
  - Start Year
  - End Year (default is Start Year)
  - Interval (years between input values)
  - Source
- Click “OK” to create blank data input shell
- You cannot proceed unless all items have been entered
Add New Data: Population Example

- Data Type: Population
- Data Format: Population
- Age Group: Five-year
- Min Age: N/A; Max Age: 80
- Start Year: 1985; End Year: 1985
- Interval: 1
Add New Data:
Population Example

<table>
<thead>
<tr>
<th>Population by Age and Sex</th>
<th>Midyear population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Both sexes</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>All ages</td>
<td>10,715,302</td>
</tr>
<tr>
<td>0-4</td>
<td>1,390,000</td>
</tr>
<tr>
<td>5-9</td>
<td>1,201,500</td>
</tr>
<tr>
<td>10-14</td>
<td>1,056,706</td>
</tr>
<tr>
<td>15-19</td>
<td>1,089,985</td>
</tr>
<tr>
<td>20-24</td>
<td>1,159,947</td>
</tr>
<tr>
<td>25-29</td>
<td>1,067,926</td>
</tr>
<tr>
<td>30-34</td>
<td>875,358</td>
</tr>
<tr>
<td>35-39</td>
<td>695,354</td>
</tr>
<tr>
<td>40-44</td>
<td>553,724</td>
</tr>
<tr>
<td>45-49</td>
<td>457,630</td>
</tr>
<tr>
<td>50-54</td>
<td>359,908</td>
</tr>
<tr>
<td>55-59</td>
<td>274,485</td>
</tr>
<tr>
<td>60-64</td>
<td>195,279</td>
</tr>
<tr>
<td>65-69</td>
<td>90,000</td>
</tr>
<tr>
<td>70-74</td>
<td>45,000</td>
</tr>
<tr>
<td>75-79</td>
<td>22,500</td>
</tr>
</tbody>
</table>

<p>| Population 1985 Ages 0 to 80 (5-Year) |
|---|---|---|---|</p>
<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5-9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10-14</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15-19</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20-24</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25-29</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30-34</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>35-39</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40-44</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>45-49</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55-59</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60-64</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>65-69</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>70-74</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75-79</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>80+</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Add New Data:
Population Example

- Repeat for all inputs
- Population
  - Only one is needed for a projection
- Mortality
  - One or more, at least one with data for all age groups
- Fertility
  - One or more, at least one with data for all age groups of women of reproductive age
- Migration
  - Optional, but recommended. At least one input by age.

### Population 1985 Ages 0 to 80 (5-Year)

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>710,000</td>
<td>680,000</td>
<td>1,390,000</td>
</tr>
<tr>
<td>5 - 9</td>
<td>601,552</td>
<td>599,940</td>
<td>1,201,500</td>
</tr>
<tr>
<td>10 - 14</td>
<td>531,057</td>
<td>525,649</td>
<td>1,056,706</td>
</tr>
<tr>
<td>15 - 19</td>
<td>613,793</td>
<td>476,192</td>
<td>1,089,985</td>
</tr>
<tr>
<td>20 - 24</td>
<td>703,468</td>
<td>456,479</td>
<td>1,159,947</td>
</tr>
<tr>
<td>25 - 29</td>
<td>654,624</td>
<td>413,302</td>
<td>1,067,926</td>
</tr>
<tr>
<td>30 - 34</td>
<td>531,398</td>
<td>343,960</td>
<td>875,358</td>
</tr>
<tr>
<td>35 - 39</td>
<td>416,520</td>
<td>278,834</td>
<td>595,354</td>
</tr>
<tr>
<td>40 - 44</td>
<td>320,363</td>
<td>225,361</td>
<td>555,724</td>
</tr>
<tr>
<td>45 - 49</td>
<td>270,353</td>
<td>187,277</td>
<td>457,630</td>
</tr>
<tr>
<td>50 - 54</td>
<td>213,639</td>
<td>146,269</td>
<td>359,908</td>
</tr>
<tr>
<td>55 - 59</td>
<td>166,875</td>
<td>107,610</td>
<td>274,485</td>
</tr>
<tr>
<td>60 - 64</td>
<td>121,324</td>
<td>73,955</td>
<td>195,279</td>
</tr>
<tr>
<td>65 - 69</td>
<td>80,000</td>
<td>100,000</td>
<td>180,000</td>
</tr>
<tr>
<td>70 - 74</td>
<td>40,000</td>
<td>50,000</td>
<td>90,000</td>
</tr>
<tr>
<td>75 - 79</td>
<td>20,000</td>
<td>25,000</td>
<td>45,000</td>
</tr>
<tr>
<td>80+</td>
<td>10,000</td>
<td>12,500</td>
<td>22,500</td>
</tr>
</tbody>
</table>

**Total**
- 6,012,966
- 4,702,336
- 10,715,302