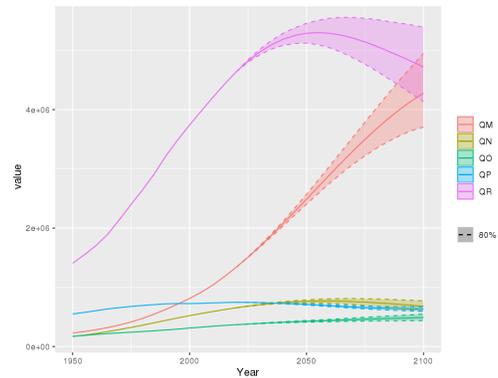
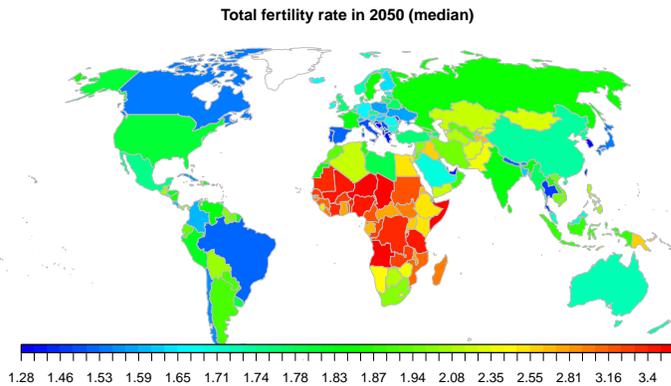


**CS&SS/STAT/SOC 563**  
**STATISTICAL DEMOGRAPHY AND DATA SCIENCE**  
Spring Quarter 2021, MWThF 2:30–3:20pm  
Instructor: Adrian Raftery, Departments of Statistics & Sociology



Demography aims to estimate and forecast population, fertility, mortality and migration. This is important for government policy-making, private sector planning, and research in the health and social sciences, and is also critical for climate science and global health. It has traditionally been done using deterministic methods, but these ignore uncertainty and measurement error.

Over the past decade, modern statistical methods have been developed for this, and these were adopted by the UN in 2015 for their official population forecasts for all countries. Another recent breakthrough is the use of social media data and other big data, particularly to estimate migration. Statistical demography and data science is expanding rapidly, and this course will teach theory and practice of methods and models of the field.

**Topics:**

- Review of basic demographic methods
- Modeling age-specific rates, including model schedules and Lee-Carter method
- Statistical modeling and projection of fertility, mortality, migration and population
- Reconstructing population and vital rates from imperfect data.
- Demography and Big Data.

**Prerequisites:** A good grounding in basic probability and statistics, some exposure to mathematical statistics, and basic mathematics including basic calculus and matrix algebra. SOC 533 (demographic methods) is also recommended.