DATA PROJECTS FEASIBILITY RESOURCE GUIDE

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Introduction

This guide contains information and resources researchers may use to gauge the feasibility of their potential research project using AUA data. In drafting their research proposals for the AUA Data Research Program (DRP) or for a Statistical Services project, researchers may use this guide to a) understand the type of studies that can be conducted using the AQUA Registry or the AUA Census data, b) understand what types of studies cannot be conducted currently due to the limitations of the data or of available resources, as well as c) review studies that have been accepted in the Data Research Program or recently published with the support of the AUA Statistical Services. Finally, this guide will highlight key factors for developing a well-designed research proposal and provide additional resources for reference.

Disclaimer: The materials and information contained in this guide are intended for information purposes only. The guide does not contain an exhaustive list of projects that can or cannot be completed using the AQUA Registry and the AUA Census data. Please contact the AUA Statistical Services by email at dataservices@AUAnet.org to discuss your specific research project.

Studies That Can Be Conducted Using AQUA Registry or AUA Census Data

Using the AQUA Registry Data

The AUA Quality (AQUA) Registry is run by the American Urological Association and is a national Qualified Clinical Data Registry (QCDR) designed to measure, report, and improve healthcare quality and patient outcomes. The Registry collects real-world data directly from urology practices' electronic health record (EHR) systems and enables practices to participate in quality improvement activities, contribute to national urology benchmarks, and access quality measures meaningful to urologists. The registry itself was started in 2014 and contains data from 2013 up through the present. The AQUA Registry is a collection of over 214 active practices including 2,470 active providers and 12 million patients spread across the United States and US territories as of March 2024.

The AQUA Registry data can be used to:

- Evaluate the safety and/or effectiveness of an intervention or rapidly changing technology.
- Measure the incidence of a particular disease in a specific population, or in two or more subgroups defined by common characteristics (e.g., etiologic research).
- Assess the characteristics of people who develop a specific disease.
- Characterize the treatment patterns, treatment combinations, or costs of treatment for a disease in a specific population, or in two or more subgroups (e.g., health services research or disparities research).

- Measure the occurrence of outcomes among patients with a disease, compare the rate of outcomes among two or more subgroups of patients (often defined by different types or levels of treatment) with a particular disease (e.g., clinical research).
- Conduct data Linkages between the AQUA Registry Data, and the Census data, or with other data sources.
- Conduct surveillance for rare urological events.
- Evaluate adherence to published guidelines and standard medical practice.
- Evaluate proxy measures for access to care and barriers to care, such as patient or practice neighborhood factors, rurality level, and social determinants of health.

Using the AUA Census Data

The AUA Annual Census was launched in 2014. It is a specialty-wide survey of all members in the urology community across the globe. This critical survey provides important information on urology workforce and practice to clinicians, policymakers, patients, and the general public.

The AUA Census data can be used to:

- Identify trends of urology clinical workforce over the years
- Evaluate the impact of health policy decisions and guidelines on health care providers' practice of urological care.
- Assess demographic characteristics and geographic distribution of urologic providers.
- Conduct cross-sectional and longitudinal studies to assess variations across urology practice nationwide.
- Assess variations in clinical practice among clinicians who provide a specific type of patient care.
- Assess variations in clinical practice by provider characteristics such as education and training, primary and secondary subspecialty, licensure, and employment status.
- Assess variations in clinical practice by practice characteristics such as practice setting, number of advanced practiced providers, number of office locations, etc.
- Evaluate providers' work satisfaction and retirement plans.
- Evaluate the volume, scope, and duration of work for members of the urological care delivery team.

Available AQUA and Census Datasets

- Five disease-specific AQUA patient cohorts on non-cancerous urologic conditions are currently available for analysis. Explore the data dictionaries for each condition below:
    - Overactive Bladder (OAB)
    - Benign Prostatic Hyperplasia (BPH)
    - Male Stress Urinary Incontinence (SUI)
    - Kidney and Ureteral Stones
    - Erectile Dysfunction (ED)

Note: Diseases not listed above can be considered if patients of interest and the associated procedures and outcomes are well-defined by ICD/CPT codes.

- There are ten years' worth of data currently available, 2014 to 2023, from the AUA Annual Census covering a wide range of topics relevant the urologic workforce and practice. The Census has domestic and international modules for the entire urology workforce including:
  - Urologists (Practicing and Non-Practicing)
  - Residents and Fellows
  - Practice Managers and Administrators
  - Researchers
  - Medical Students
  - Nurse Practitioners (NPs)
  - Physician Assistants (PAs),
  - Nurses (RNs)
  - Researchers
  - Faculty

- Review the questions asked on the AUA Census over the years and the census results.

To request additional information on data sources, please contact AUA Statistical Services at dataservices@auanet.org.

Example of Statistical Services and Methods Offered

The AUA Statistical Services can assist researchers with many types of services and analyses, including those listed below:

- Study design
- Propensity score matching, nested case-control design
- Sample size determination
- Descriptive statistics and analysis of variance
- Hypothesis testing
- Statistical modelling
- Bivariate or multivariate regression analyses
- Survival analyses
- Longitudinal and time-series analyses
- Mixed models
- Meta-analyses
- Non-parametric analyses
- Principal component analysis, clustering
- Subgroup and sensitivity analyses
- Data visualization (plots, charts/graphs, maps, etc.)

- Support in results interpretation and preparation for dissemination (abstract and manuscript development, presentations)
- Survey development
- Data collection, management, cleaning/curating

Studies that *Cannot* be Conducted Currently Using AQUA Registry or AUA Census Data

Not Feasible Using the AQUA Registry Data

Projects that propose to assess the statistics or research questions below cannot currently be completed using the AQUA Registry data:

- Statistics related to the entire US population.
- Input AQUA Registry data (patient-level, provider-level, practice level or any summary data) into generative or open AI tools.
- Use unstructured EHR data that has not yet been curated (e.g., vital signs, laboratory test results, cancer stages/ grades, progress notes, clinical notes, radiology reports, hospital stays or discharges, or patient narratives).
- Cost of materials used in an intervention, cost-effectiveness, or cost-elements that vary per practice.
- Decision-tree analyses, due to software limitations.
- Patients' or providers' perspectives on the treatment or quality of care received. This includes the identification of patients that meet certain criteria, contacting patients for follow-up or sampling, or assessing patient-reported outcomes.
- Data linkages that require significant resources or use of restricted patient PHI, or other external datasets not currently housed by AUA.

Limitations of the AUA Census Data

The AUA Census data is subject to the limitations listed below. Projects that propose to assess statistics or research questions without accounting for these limitations cannot be completed.

- The Census currently reflects the provider perspective. Please refrain from submitting studies focusing solely on patient perspectives for consideration.
- As a population-based and weighted survey, the AUA Annual Census data analysis relies on the absolute number of responses to report statistics for small geographic, demographic, and clinical categories. Some demographics and racial/ethnic minority groups are not well represented in the urologist population and, therefore, are difficult to analyze.

- While data based on the US Practicing Urologists population within a single year are weighted and representative of the entire population of US Practicing Urologists for that year, data based on other populations represents only the perspectives of the respondents within each population.
- Longitudinal data across years or multivariable analysis is unweighted for the US Practicing Urologists population and based on the sample with available data.
- Geographic classifications, such as rurality levels and state, are determined based on the primary office location in the NPI file. The actual geographic coverage for each practicing urologist may extend beyond the area reported. *Note: The ability to represent findings geographically (e.g. heat maps) may be limited to or impacted by the outcome of interest and geographic level of analysis.*
- Census data are self-reported and may be subject to recall or response bias.

Additionally, AQUA registry or Census projects similar to those that have been completed recently or that make use of the same data source and methods with no elements of innovation will not be selected for further consideration. Researchers should contact the AUA Statistical Services by email at dataservices@AUAnet.org to discuss their research ideas prior to submitting a proposal for the Data Research Program.

Recent Projects and Publications

The following summary of recent projects and publications using AQUA Registry and AUA Census data is provided as a reference and resource for better understanding the kinds of data and analyses that are possible.

Projects Supported in the 2024 Data Research Program

AQUA Projects

- Management Patterns for Benign Prostatic Hyperplasia: Analysis of Patient and Provider Factors that Drive Treatment Selection in the United States
- Understanding Practice Patterns and Utilization of 3rd-Line Therapies for Overactive Bladder and Storage LUTS: Trends from the AUA AQUA Registry

Census Projects

- Examining Regional Variation in Prostate Biopsy Practices in the United States
- Advanced Practice Providers and Procedural Care in Urology
- Longitudinal Assessment of Planned and Unplanned Workforce Attrition among Urologists and Urology Trainees
- Generation Gaps in the Urology Workforce: An Analysis of Intergenerational Differences in Demographics, Practice Characteristics, Integration of Technology, and Wellness

To review the project descriptions for these six projects, visit the Data Research Program website.

Recent Publications Using the AQUA Registry Data

- Factors Influencing Medication Selection for Management of Overactive Bladder: Trends and Insights from AUA Quality Registry. Review this article.
- Who Progresses to Third-Line Therapies for Overactive Bladder? Trends From the AQUA Registry. Review this article.
- Time Trends and Variation in the Use of Active Surveillance for Management of Low-risk Prostate Cancer in the US. Review this article.
- Patterns of Surgical Management of Male Stress Urinary Incontinence: Data from the AUA Quality (AQUA) Registry. Review this article.
- Insights from the AQUA Registry: A Retrospective Study of Anticholinergic Polypharmacy in the United States. Review this article.
- How Has the Average Number of Radical Prostatectomies Performed by Urologists Changed Over Time? Review this article.
- Impact of the COVID-19 Pandemic on Urological Care Delivery in the United States. Review this article.

Recent Publications Using the AUA Census Data

- Factors Influencing Medical Students' Pursuit of Urology: Results From the AUA Census (2019-2021). Review this article.
- Use of the American Urological Association Clinical Practice Guidelines: Data from the AUA Census. Review this article.
- Professional Burnout of Advanced Practice Providers Based on 2019 American Urological Association Census Data. Review this article.
- The Current State of Educational Debt among Practicing Urologists. Review this article.
- Increasing Use of Advanced Practice Providers for Urological Office Procedural Care in the United States. Review this article.
- Demographic and Practice Trends of Rural Urologists in the U.S.: Implications for Workforce Policy. Review this article.
- The Gender Pay Gap in Urology. Review this article.

Research Proposal Considerations

The AUA recommends that investigators take into account the following considerations when developing their research proposal and/or data request, particularly if using the AQUA Registry Data.

Study Purpose: Define the nature of the study (descriptive, comparative, predictive, etc.), the research question (s) you want addressed, the aims and objectives, the main exposures, and the outcomes to be evaluated.

***Patient Population*:** Consider which ICD/CPT codes to include/exclude to define the patient population. Define characteristics of the patient population and sub-population(s) to include or exclude in terms of demographics, clinical characteristics (e.g., medical history, prior treatment history, comorbidities, length of follow-up, etc.), and practice/provider characteristics.

Exposure or Treatment: Define the main exposure(s) of interest. This could be a treatment option, a diagnostic or screening tool, demographic, behavioral, environmental, or clinical factors, etc. Provide appropriate ICD codes, CPT codes, or medication names if applicable.

Endpoints or Outcomes: Define the outcome(s) of interest. Specify the level of measurement of the outcomes (e.g., nominal, ordinal, interval/scale, ratio). Provide appropriate ICD codes, CPT codes, or medication names if applicable.

Covariates: Include important confounders and effect modifiers that can have an impact on the outcome. Provide appropriate ICD codes, CPT codes, or medication names if applicable.

Timeframe: Define whether the study is cross-sectional or occurs over a period of time, and the timeframe of interest. Specify dates of diagnoses, treatment, outcomes of interest, and length of follow-up.

Limitations: As with all clinical sources of data, the AQUA registry data may have some missing, incomplete, or inaccurate data. Specify how those should be quantified or handled. Additionally, depending on the project design, several biases could be introduced in the study. These include selection bias, bias stemming from changes over time in confounding factors, or from differences in measuring procedures over time.

Generalizability: The results of your study using AQUA Registry data may not be extrapolated beyond the study population but may still be useful to inform clinical decisions.

Next Steps

AUA Data Research Program

Learn more about the Data Research Program.

Review the Program Announcement.

Apply to the Program May 1 – June 23.

Explore AUA Data Sources

Review the Data Dictionaries for the Patient Cohorts.

Review Census Results.

Explore the Questions asked on the Census.

AUA Statistical Services

Submit your Project Request Form.

Do you still have questions on the feasibility of your research project? Or would you like to learn more about the programs listed above? We are here to help. Email the AUA Statistical Services at dataservices@auanet.org.