



Career paths for academic biostatisticians

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Working as a biostatistician can take many different forms, including following an academic path, typically at a University or a research organisation, working in industry, for example in a pharmaceutical company or clinical research organisation (CRO), or working in government, where the main roles are in applied work supporting the development and evaluation of policies, products and programs. In this document, we provide an overview of academic careers in biostatistics, describing the activities that are conducive to career progression within this path. For completeness we also provide a brief overview of alternative careers in biostatistics.

Most academic careers in biostatistics involve a combination of (i.) collaborating on health and medical research studies, (ii.) conducting methodological research and (iii.) teaching. The proportion of time spent on each of these activities varies among biostatisticians depending on whether their appointment is a traditional teaching and research position or is primarily research-focussed, the focus of the unit/team in which they work, and the interests, aptitude and skills of the person involved. Below we outline the characteristics of these three types of work, each of which is equally important to maintaining this discipline, with its critical underpinning role in public health and medical research. We also describe the activities that are typically conducive to career progression to the higher academic levels within each type of work.

Methodological research

- Conducts research into statistical methodology, which includes developing, evaluating and translating new methods
- Is almost always combined with at least some collaborative applied research
- May include biostatistics teaching (see below) and often includes research training of biostatisticians and non-statistician researchers e.g. short courses and workshops on statistical methodology
- Would typically have a PhD in biostatistics/statistics
- Often funded by grants in methodological research, and fellowships (which may mean short-term [e.g. 1-5 year] contracts)
- To reach the higher academic levels with this focus, it is important to:
 - o develop an area of expertise in which you can establish a national and ideally an international reputation
 - o develop a portfolio of first and senior author methodological publications
 - o lead methodological grants and/or obtain fellowships
 - o be primary and co-supervisor of PhD students on methodological research topics
 - o conduct peer reviews of methodological research papers, and (at the top levels) may have an editorial position with a statistical journal
 - o contribute to the discipline of biostatistics, such as statistical committee memberships, organising conferences, giving keynote presentations, providing workshops and contributing to peer-review of research funding
 - o (at the top levels) establish a methodological research group including post-docs

Applied research

- Provides statistical support/oversight for a range of collaborative applied research projects. At the entry level this support may take the form of hands on/analytic support within a statistical consulting team or as a stand-alone position, while at the higher levels it may consist primarily of input to grants and study design, planning of analyses, involvement in collaborative networks and supervision/management of staff
- May be coupled with methodological research
- May include biostatistics teaching (see below) and often includes research training for non-statisticians e.g. short courses and workshops
- Typically, entry requires a Master of Biostatistics or equivalent
- To develop in this area would ideally have a PhD in biostatistics or a related discipline, although it is possible to bypass this with experience
- Often funded by grants for applied research projects that include a budget for statistical support (which may mean short term [e.g. 12-month] contracts)

- To reach the higher academic levels with this focus, it is important to:
 - develop strong collaborations with one or more health and medical research groups, within which statistical leadership is demonstrated
 - have a growing portfolio of high-quality applied research papers in a specific discipline (often as a middle author, ideally as 2nd or 3rd author to demonstrate responsibility for statistical methods or as second-last author to demonstrate seniority supervising junior statisticians)
 - develop a portfolio of grants as a co-investigator
 - provide mentoring and training to health and medical researchers, potentially including co-supervision of non-statistician PhD students
 - develop a team leadership role e.g. through the supervision of junior statisticians
 - conduct peer review of health and medical research papers, and (at the top levels) possibly have a statistical editorial position within a content-area journal
 - serve on grant review panels
 - contribute to the discipline of biostatistics, such as statistical committee memberships, organising conferences, chairing and presenting at symposiums, and contributing to peer-review of research funding
 - (at the top levels) manage a team, and be responsible for securing and managing income for the team through collaborative research projects
 - (at the top levels) may demonstrate broad community engagement e.g. via industry or government collaborations, university-wide initiatives, international collaborations, etc.

Teaching

- Involves teaching biostatistics or a related discipline
- Typically based at a university and may be contract-based or a tenured (ongoing) position
- Typically combined with methodological research and/or applied research
- May include research training of biostatisticians and non-statistician researchers e.g. short courses and workshops
- Would need a PhD in biostatistics or statistics
- To reach the higher academic levels with this focus, it is important to:
 - Coordinate and deliver Masters-level subjects
 - take responsibility for course/program coordination
 - be involved in curriculum design and development of teaching materials
 - be primary- or co-supervisor of PhD students, possibly including non-statisticians doing quantitative projects
 - (at the top levels) manage teaching programs and teams

Other Career Paths for Biostatisticians

Industry

Biostatisticians may work in a pharmaceutical company, a CRO or biotechnology company. The main role of a biostatistician in such an organisation is typically applied research with a strong focus, in addition to performing statistical analyses, on project management, generating tables/listings/figures and report writing, although there may be some scope to conduct methodological research (primarily larger companies).

See <https://www.psiweb.org/careers/jobs/Job-Profiles> for some example job profiles in the pharmaceutical industry, and [Leading beyond regulatory approval: Opportunities for statisticians to optimize evidence generation and impact clinical practice](#) for further information about opportunities for statisticians in the pharmaceutical industry.

Government

Biostatisticians who work in government may work in health research, policy development, and/or data analysis to inform public health decisions. As with industry, these roles typically have a strong focus on project management, generating tables/listings/figures and report writing, although there is generally little scope for methodological research.

Consultancy

Biostatisticians may also work independently or as part of a consultancy company where they provide services, usually “at arm’s length” rather than in close collaboration, to any of the above categories. Again, this is typically applied work.