THE AGENCY ADVANTAGE

PROFILE OF AN EPIDEMIOLOGIST

ALICIA GAYLE, GLOBAL EPIDEMIOLOGY LEAD

OVERVIEW OF EPIDEMIOLOGY & REAL-WORLD EVIDENCE (RWE)

Epidemiology and Real-World Evidence (RWE) play a critical role across pharmaceutical research, clinical development, medical affairs, market access, and regulatory strategy. Epidemiologists use population-level health data, observational studies, and advanced analytics to better understand disease patterns, treatment outcomes, patient populations, and healthcare systems.

Within pharma, epidemiology supports:

- Clinical trial design and optimisation
- Endpoint selection and validation
- Regulatory and HTA evidence generation
- Historical control arms and synthetic cohorts
- Post-authorisation safety and effectiveness studies
- Label expansion strategies
- AI-enabled predictive modelling and data analysis

As healthcare data ecosystems continue to expand globally, epidemiologists increasingly work at the intersection of biostatistics, machine learning, clinical development, and regulatory science to accelerate drug development and improve patient outcomes.

ALICIA'S BACKGROUND

Education

- BSc in Statistics and Computer Science
- MSc in Epidemiology, Imperial College London
- PhD in Epidemiology, Imperial College London

Career Path

Alicia originally planned to pursue a career in teaching before attending a pharmaceutical industry event hosted by PSI (Statisticians in the Pharmaceutical Industry). Exposure to pharmaceutical statistics and drug development introduced her to the possibilities of applying analytical skills within healthcare and life sciences.

Following her MSc in Epidemiology at Imperial College London, Alicia entered the pharmaceutical industry through an entry-level epidemiology role at Boehringer Ingelheim, where she used her strengths in analytics, coding, and problem-solving despite limited prior industry exposure.

CURRENT ROLE

AS AN EPIDEMIOLOGY LEAD, ALICIA:

- Oversees integrated epidemiology and real-world evidence strategies across drug development programmes
- Supports Phase II and III clinical trial design through observational studies and population-level insights
- Evaluates clinical endpoints and patient populations to optimise trial feasibility and regulatory acceptance
- Designs and interprets epidemiological studies using real-world healthcare datasets
- Explores the application of synthetic control arms and external comparator cohorts

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CURRENT ROLE CONTINUED...

- Collaborates cross-functionally with clinical development, biostatistics, regulatory affairs, medical affairs, and data science teams
- Contributes to innovative approaches involving AI, machine learning, and digital health technologies to improve evidence generation
- Works extensively with global healthcare datasets while navigating data governance, interoperability, and geographic privacy restrictions

KEY RESPONSIBILITIES

Clinical Development Support
Using epidemiological evidence to optimise trial design, patient selection, endpoint strategy, and support regulatory submissions .

Real-World Evidence Generation
Designing observational studies using electronic health records, registries, and claims databases to support evidence generation throughout the product lifecycle.

Data Analytics & Interpretation
Applying statistical programming and advanced analytics to derive insights from complex healthcare datasets.

Innovation & AI Integration
Exploring machine learning, synthetic data, and AI-driven methodologies to modernise clinical research and improve efficiency.

AT A GLANCE

CHALLENGES

- Complex healthcare datasets
- Data privacy and governance
- Regulatory acceptance of RWE
- Fast-moving AI and analytics innovation
- Learning pharma terminology and processes

BENEFITS

- Strong patient impact
- Exposure to cutting-edge science
- Career mobility across pharma functions
- Opportunities in rare disease, oncology, respiratory, vaccines, and more
- A future-facing role at the centre of evidence generation

ADVICE FOR ASPIRING PROFESSIONALS

Alicia's biggest advice is to play to your strengths. For example, someone from the CDC with infectious disease experience should target vaccines, diagnostics, infectious disease, or public health-related pharma roles.

She also recommends staying open to adjacent roles such as RWE, HEOR, regulatory affairs, medical affairs, market access, policy, and patient advocacy. Strong analytical skills, coding ability, curiosity, and adaptability can take you far, even without deep pharma knowledge at the start.