# BRIAN MUIR, PHD

Highly-inquisitive team-leader with 11+ years of experience employing machine learning and statistics in the healthcare industry and in computational biology. Direct the forecasting of $billions in pharmacy and medical expenses using predictive models in R for Centene Corporation's (Fortune 500) marketplace insurance LOB.

## 💼 PROFESSIONAL EXPERIENCE

**Current | May 2020**

### Director – Marketplace Forecasting
Centene Corporation / *Actuarial Services*    📍 Chicago, IL

**May 2020 | Jul 2018**

### Manager – Analytics & Reporting
Centene Corporation / *Actuarial Services*    📍 Chicago, IL

- Direct the development, implementation, and presentation of a highly-visible forecast for 7,000+ financial estimates of medical cost and utilization by month for 27 state health plans and 11 claim categories (e.g. hospital inpatient, primary care, specialty Rx).
- Transformed the medical forecast beyond its essential function as a financial reporting tool by adding member-segmented granularity that pinpoints emerging trends for targeted business actions. Present insights to Centene's CFO in monthly calls.
- Lead a team of six actuaries and data analysts providing regular guidance and skill training sessions in R.
- Demonstrated ability to build strong collaborations with various technical and non-technical business partners with analytic support and business knowledge across medical, pharmacy, provider, membership, health status, sales, and payment data.
- Proven record of quickly adapting team workflow to incorporate forecast estimates for direct and indirect COVID costs and various health care policy changes that impacted membership makeup and anticipated costs.
- Developed a member-level gross margin database that integrates disparate revenue and expense financial data with 40 targeted member, provider, and broker characteristics. Deployed a drill-down dashboard in RSConnect utilized widely for strategic decision making and business initiatives across departments.
- Identified an $8M annual initiative improving on risk adjustment code capture by data-mining pharmacy prior authorization data.

**Jul 2018 | Oct 2017**

### Data Scientist I
Centene Corporation / *Business Optimization*    📍 Chicago, IL

**Oct 2017 | Sep 2016**

### Data Analyst II
Centene Corporation / *Business Optimization*    📍 Chicago, IL

- Built and implemented a novel claims completion model using regression to estimate incurred-but-not-reported expenses prior to month end. Model is used for early-warning and to accelerate preparation of financial reporting and commentary.
- Developed a probability-based outlier detection model for episodes of care that is used to highlight targets for quality and cost-saving initiatives.
- Designed enterprise's primary care auto-assignment algorithm to optimally assign members to local providers identified as high-quality and low-cost.
- Devised interactive RMarkdown reports using automated commentary to highlight emerging trends in Rx utilization. Present findings monthly to Pharmacy Directors of local health plans.

## CONTACT INFO

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## SKILLS

Experienced in predictive analytics, statistical analysis, hypothesis testing, exploratory data analysis, experimental design, healthcare analytics, financial forecasting and budgeting.

### Languages and Tools

R, SQL, Git / Gitlab, JupyterHub, Excel, Tableau, PowerBI, CSS, Python, C++

### End-to-End R Skills

*Extraction* (DBI, dbplyr), *Wrangling* (dplyr), *Modeling / Statistics* (tidymodels, lme4, ts, etc.), *Visualization* (ggplot2, plotly, gt, DT, etc.), *Production* (RShiny, RMarkdown, RNotebooks, RSConnect)

### Statistics

Generalized linear models, time series, regression and classification trees, multi-level (mixed) models, experimental design (ANOVAs, non-parametric methods), lifetime value

# RESEARCH EXPERIENCE

**Graduate Research Assistant / Computational Biology**

University of California Riverside

Sep 2010 | Aug 2016

 Riverside, CA

- Analyzed large gene expression datasets with R (Bioconductor) using non-parametric statistical models.
- Performed statistical tests of codon evolution in cancer gene-sequence alignments using maximum likelihood models.
- Designed and directed a multi-year longitudinal experimental evolution study on fruit flies that employed advanced experimental design statistics. Supervised two to six undergraduate volunteer research assistants per quarter.
- Taught 18 quarters of upper and lower division biology courses with up to 150 students per week.
- Mentor of five fellow graduate students in Graduate Student Mentorship Program.

# EDUCATION

**University of California Riverside**

Ph.D. in Evolution, Ecology & Organismal Biology

2016 | 2010

 Riverside, CA

**Boston College**

B.S. in Biology, Psychology (Double Major)

2010 | 2006

 Chestnut Hill, MA

# PUBLICATIONS AND PRESENTATIONS

**The expression of tumour suppressors and proto-oncogenes in tissues susceptible to their hereditary cancers.**

Muir, B. & Nunney, L. British journal of cancer, 113(2), 345-353.

2015

**Peto's paradox and the hallmarks of cancer: constructing an evolutionary framework for understanding the incidence of cancer.**

Nunney, L. & Muir, B. Phil. Trans. R. Soc. B, 370(1673), 20150161.

2015

**Presentations**

International Scientific Conferences

2014-2015

- International Biannual Evolution and Cancer Conference - Lightning Talk & Poster | 2015
- Evolution Conference - Talk | 2014

# EXAMS & AWARDS

**Exams**

Society of Actuaries

2018-

- PA - Predictive Analytics | Jun 2019
- SRM - Statistics for Risk Modeling | Jan 2019
- P - Probability | Sep 2018

**Awards**

Research and Education

2010-2016

- GAANN Fellowship | U.S. Department of Education | 2016
- Outstanding Teaching Assistant | UCR Graduate Division | 2015
- Dissertation Year Fellowship Award | UCR | 2015
- Chancellor's Distinguished Fellowship Award | UCR | 2010