



**Maynooth
University**
National University
of Ireland Maynooth



The Many Hats We Wear In Stats



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How it started

“Ugh, why would anybody want to do this [statistics] for a living”
– Niamh Cahill, 2007

How it's going



niamhc_life

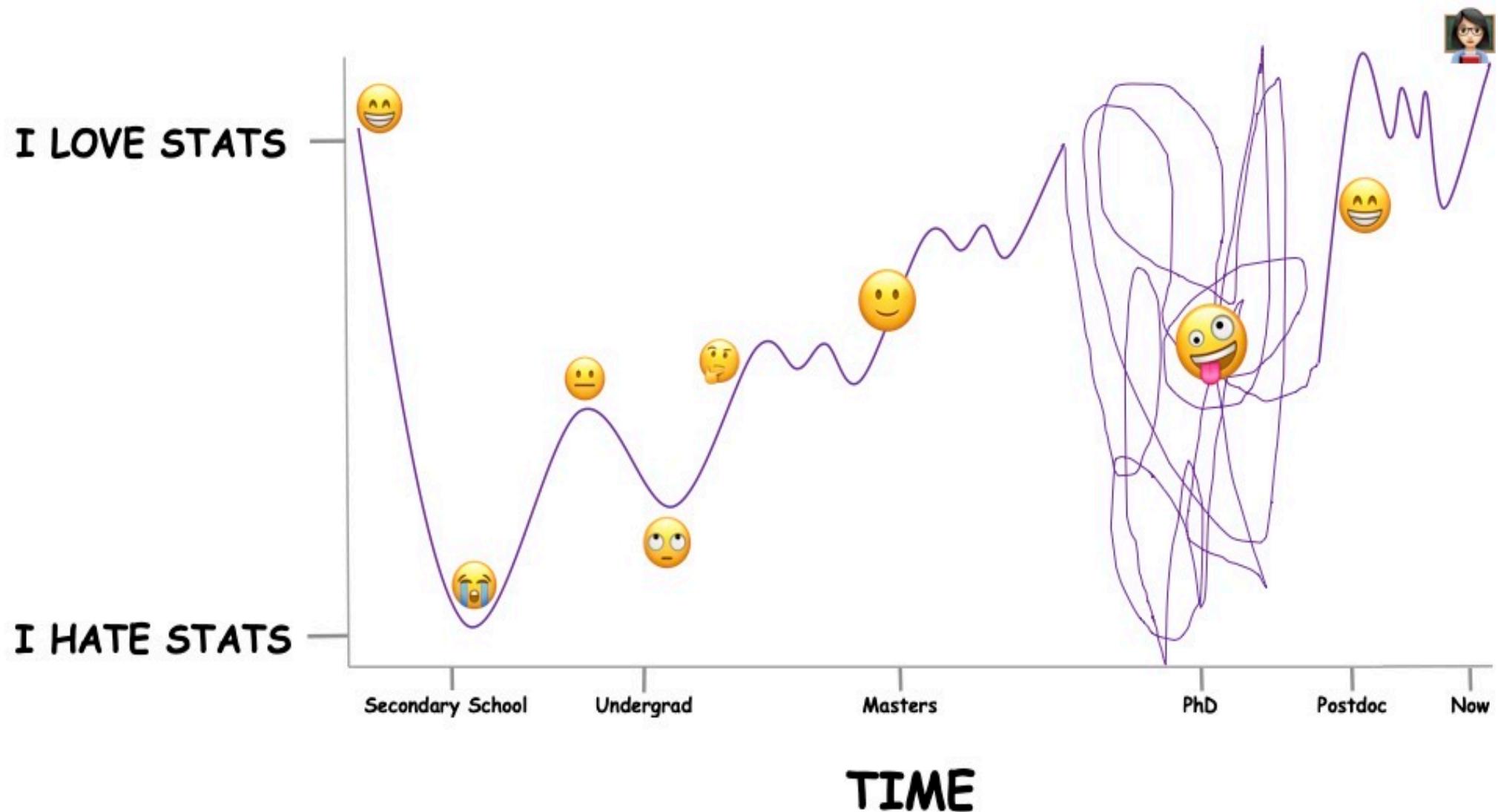
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Liked by ann.cahill and 40 others

niamhc_life I never imagined when I was student in Maynooth that I'd end up back there one day with my name on a door. So grateful for how things have worked out. #newjob #lecturer #stats

The Rollercoaster



What do I get to work on now?



- I look into the past to see how sea levels changed over the last ~2000 years
- This can help us to better understand what might happen with sea level rise in the future



- I figure out the % of women that will use contraception in the world's poorest countries in the future
- This can help determine where more work is needed in ensuring access to contraceptive methods for women
 - Access to contraception is essential to securing the well-being and autonomy of women



- Soon I will work on figuring out the chance of seeing more extreme sea levels in Ireland in the future
- This can help us to better prepare for what to expect in terms of flood events with future climate change



- I teach students about statistics and why it's so important
- I show students how to work with computer code so they can analyze data in different ways



- I go to cool places to work with people that aren't statisticians but want help with statistics
- I go to conferences to talk about my research and to hear about the work that other people do



- I write papers to publish my work so other people can use it too

How do we look at past sea levels?



**"Ok team, it's time to
go back 2000 years
and check out those
past sea levels. Our
future depends on it"**

Believe it or not the answer lies in mud!

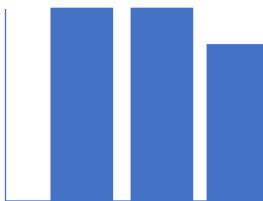


A salt marsh forms along a slope (elevation)
which we can relate to sea level.

We find these



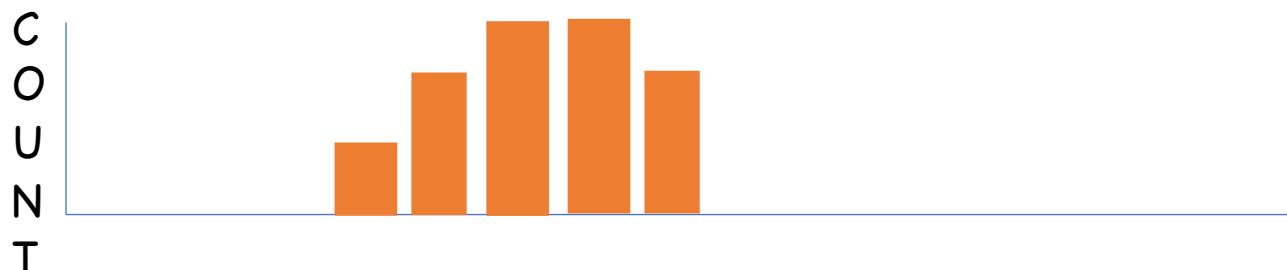
Species A
(This species likes
high elevation)



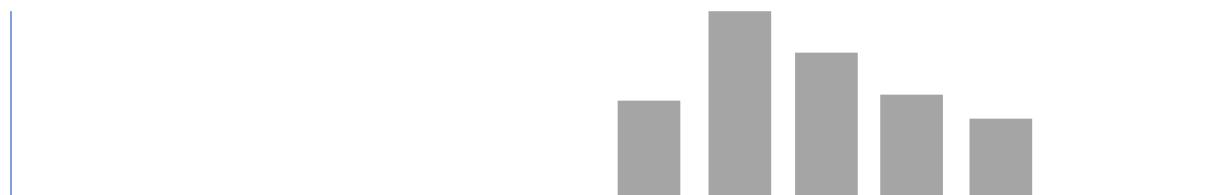
We count them



Species B



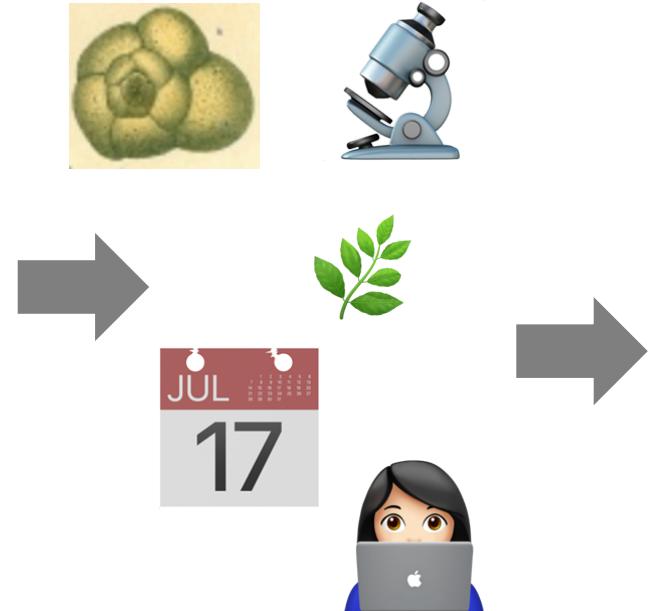
Species C
(This species likes
low elevation)



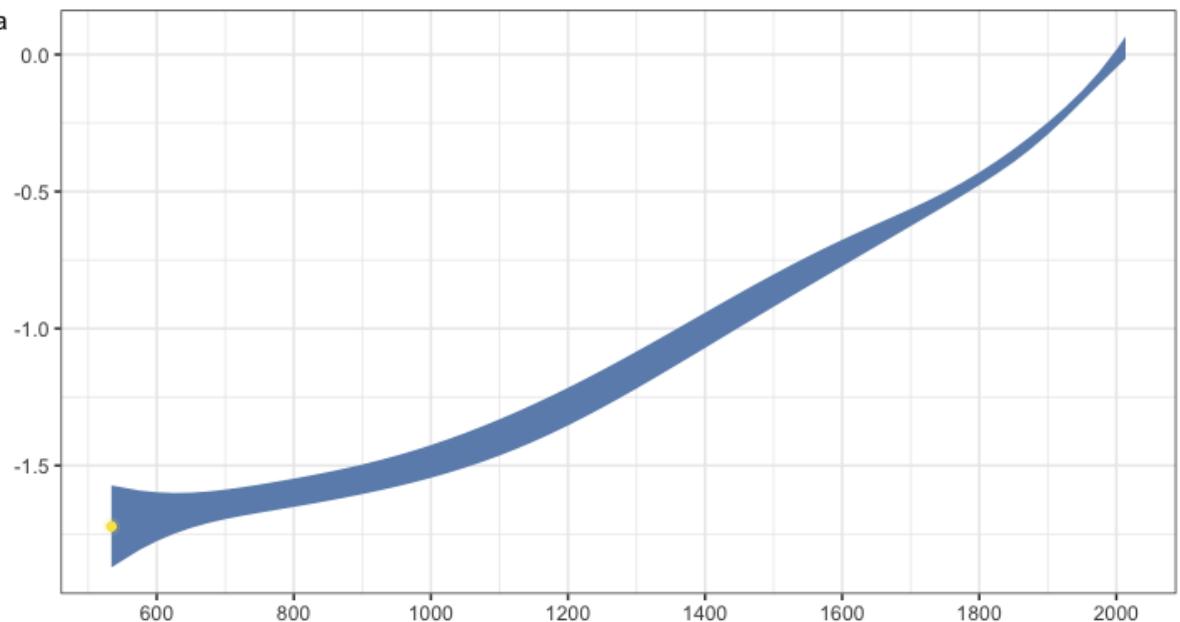
ELEVATION

The relationship between
species counts and elevation
can help us figure out
past sea levels

We start with mud and end with stats



New York Sea Level over 1500 years
Year: 533. Rate: 0.6mm/yr



Why is this important?

Allow

Allows us to understand the past and put the present into context

Help

Helps us to get better projections of future sea level rise

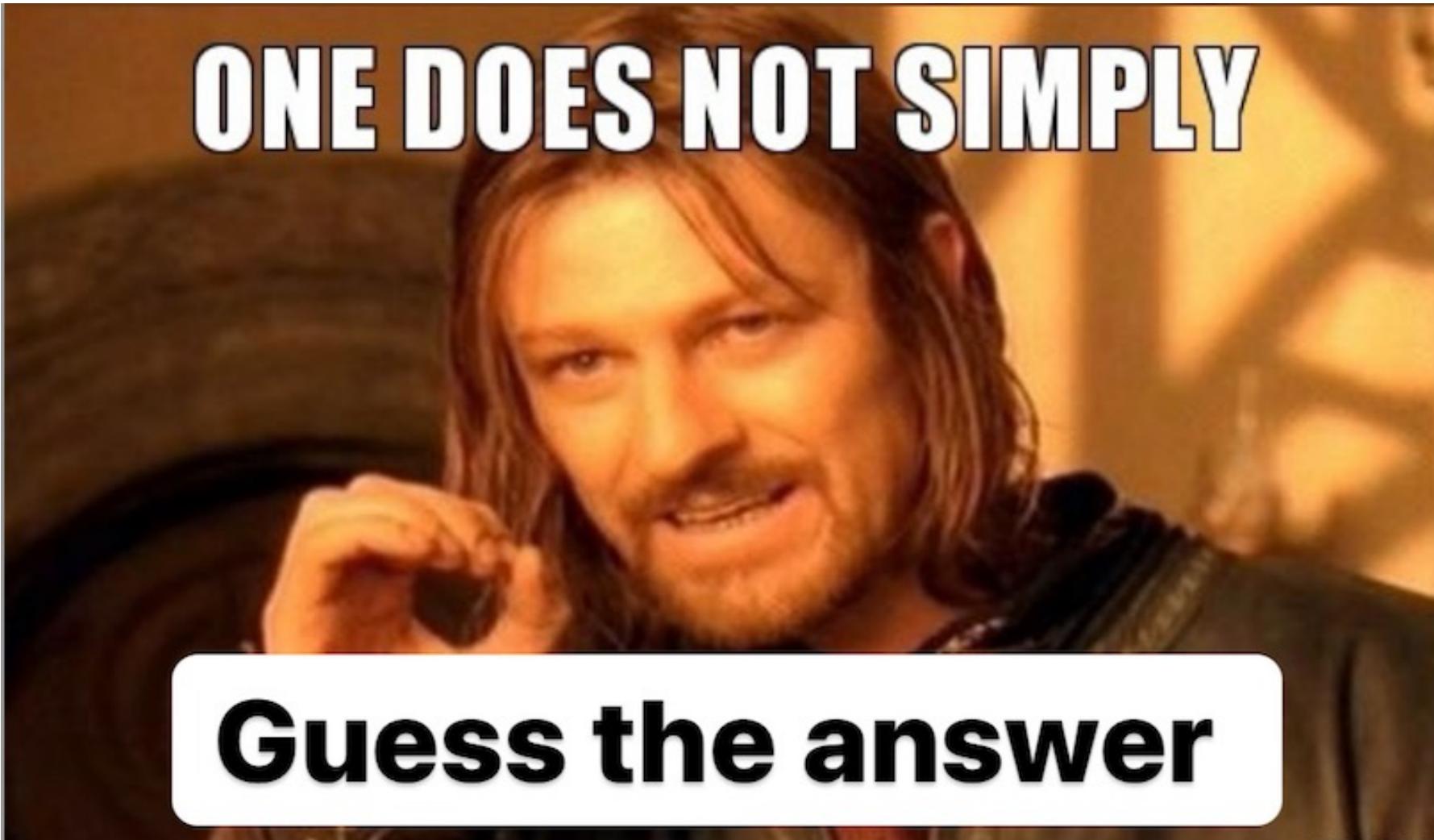
Improve

Improves our ability to plan for the future under different climate change scenarios.



@lintenafarraige

How do I figure out contraceptive use in
the world's poorest countries?



We start by trying to figure out what we already know

We start by trying to figure out what we already know



Population

We can survey samples of women from the population of interest



Sample

And ask them questions about contraceptive use

Which method are you using?

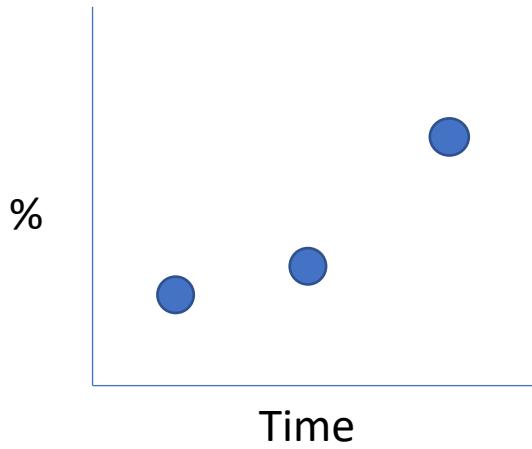
For how long have you been using your current method of contraception now without stopping?

Are you or your partner using any method to delay or avoid getting pregnant?

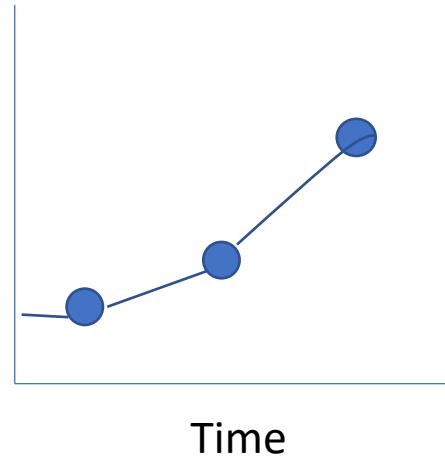
Then we can use statistical models to fill in the gaps about what we know over time



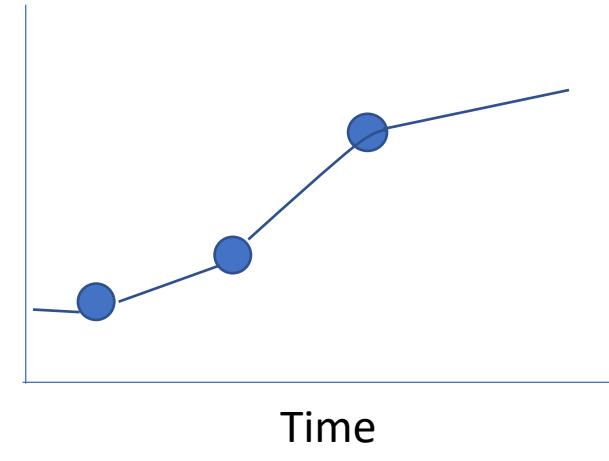
The Data



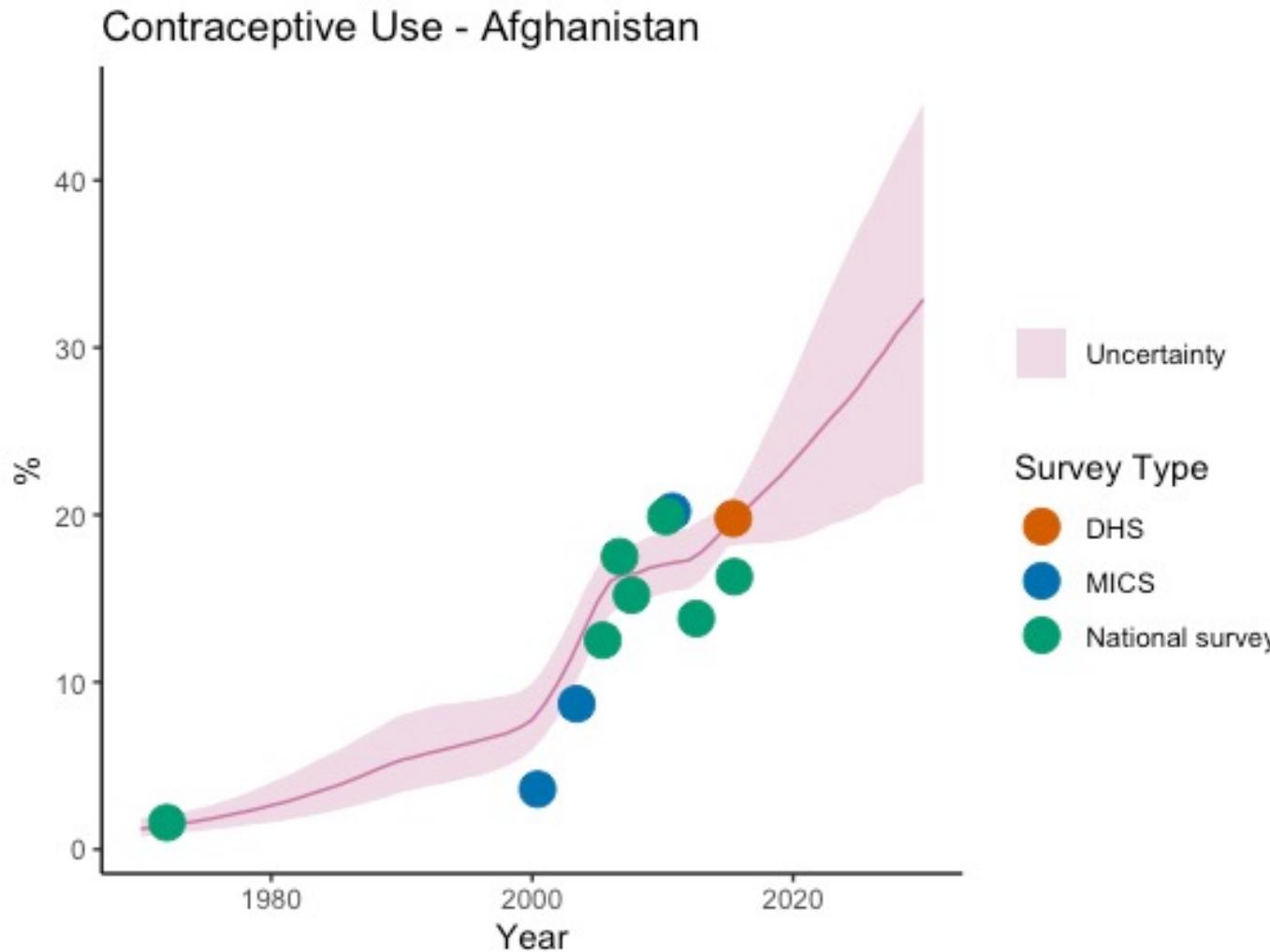
Model-based estimates



Projections



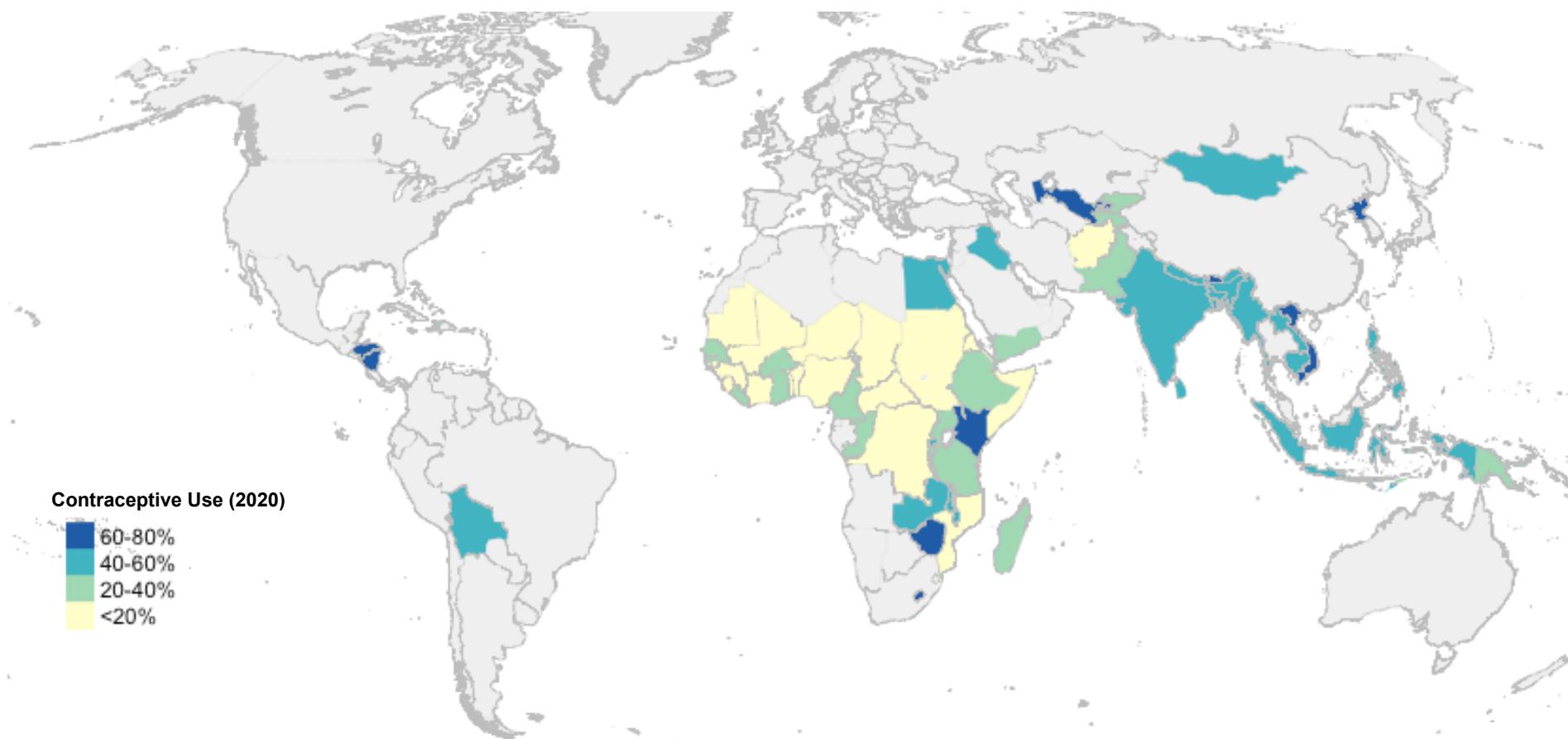
The results will look something like this



23% (uncertainty: 19% - 28%) of women are estimated to use contraception in Afghanistan in 2020

33% (uncertainty: 22% - 45%) of women are estimated to use contraception in Afghanistan in 2030

We can do this for lots of countries. Then we visualize & present results in different ways



Why is this Important

Allow

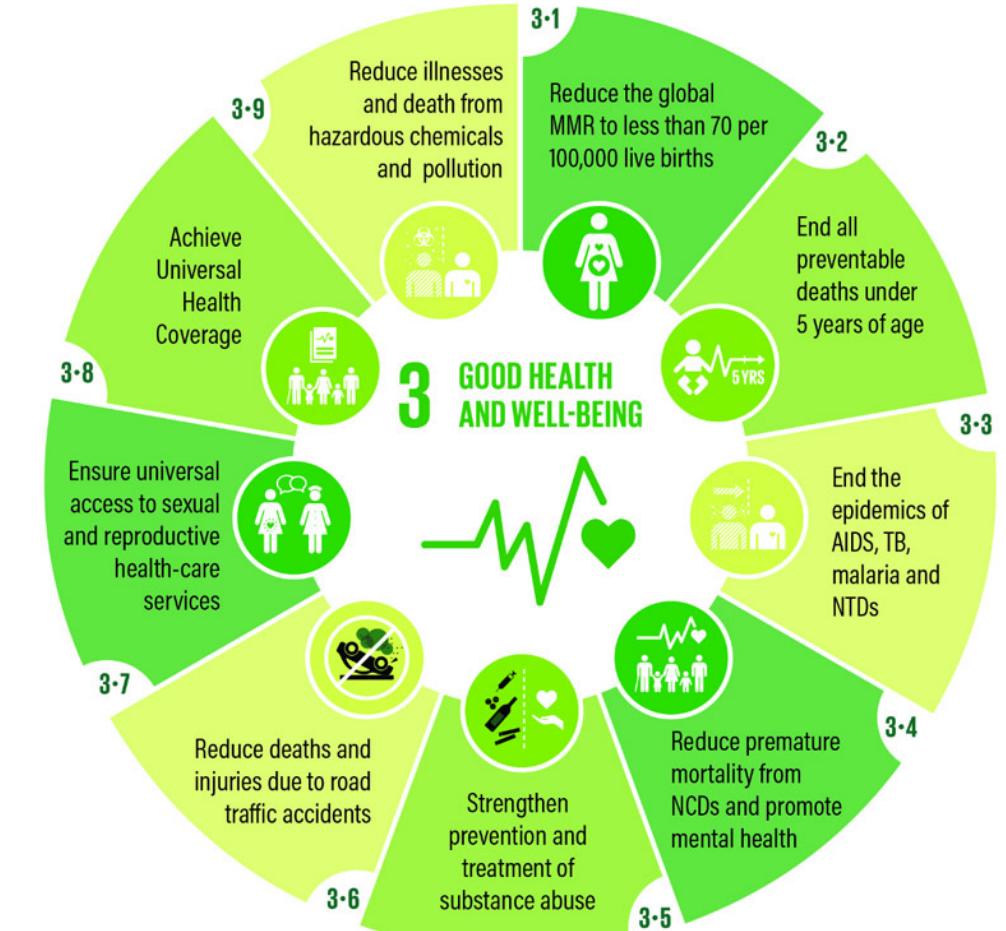
Allow women and couples to delay, space and limit pregnancies.

Help

Help to achieve healthiest outcomes for women and their children.

Improve

Improve wellbeing of families



Where has my work as a statistician taken me?

USA



- United Nations, New York City
- San Francisco, CA
- Chicago, IL
- Washington DC
- Boston, MA
- Portland, OR

Netherlands



Togo



Austria



Singapore



I asked people on Twitter to give me their “stats hats”

“I help doctors better treat hospitalized children”

“I'm a structural integrity engineer who now works as a researcher. I use stats to describe the ways in which our data are imperfect.”

“Use R to analyse Carbon Emissions from Dairy Cows and learn in your Bayesian lectures 😊”

“Currently I'm a PhD student using stats to (a) optimise the performance of offshore wind farms and (b) understand which components are most important from a reliability point of view.”

“I work as a stats advisor at a university. I help students and researchers think about their research in terms of data and mathematical models and find the fun in data analysis ;)”

“I use stats to help get new treatments for serious diseases like cancer into the Irish healthcare system.”

Maths / Stats / Data Science @ MU

Maynooth University offers programs in

- Pure Mathematics
- Applied Mathematics
- Statistics (Double Honours)
- Data Science

<https://www.maynoothuniversity.ie/mathematics-and-statistics/>