Breastfeeding Promotion

Intervention Report

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10/9/2018, updated 2/21/2019
updated 04/30/2019 by Derrick Tsoi

Model Development Narrative

Breastfeeding promotion was the first intervention in "modern" CONIC modelling, hence it has a twisting and lengthy development. Zane Rankin left IHME in February 2019, TBD who takes over as research lead.

UPDATE 04/30/2019: In March 2019 the project was reopened with interest in creating CONIC's first dual intervention simulation model (combining breastfeeding promotion with complementary feeding). This work was done as a thesis project for Derrick Tsoi who left in May 2019. The model concept can be found in the bfp_eggs repository of the simulation science folder in the J Drive. Extensive methods can be found in the model concept document. Results and a continued intervention report narrative can be found in the thesis write up and accompanying presentation.

/snfs1/Project/simulation_science/mnch/Interventions/bfp_and_eggs/reports
/snfs1/Project/simulation_science/mnch/Interventions/bfp_and_eggs/presentations

Intervention Definition & Baseline Coverage

In 2018, Yaqi conducted a systematic review and extracted 1-2 dozen sources that reported the coverage of breastfeeding promotion. However, these studies asked women vague questions like "has a healthworker told you the importance of exclusive breastfeeding," which does not reflect the intensity of the intervention as per the studies included in the Cochrane review for effect size, which generally have multiple individual counseling sessions. Therefore, it was decided that we would assume zero baseline coverage rather than modelling the results of Yaqi's review.

Effect Size Estimation

When the coverage gap framework was established, it was determined that the Cochrane review summary measures (intervention relative risk) could not be converted to a coverage gap relative risk. Therefore, Zane extracted the primary sources of the Cochrane review that measured at least 4 counseling sessions (see separate report on the BFP effect size meta-analysis. The meta-analysis itself was done in auxiliary data processing

- Sinha B, Chowdhury R, Prakash Upadhyay R, Taneja S, Martines J, Bahl R, Jeeva Sankar M; Integrated Interventions Delivered in Health Systems, Home, and Community Have the Highest Impact on Breastfeeding Outcomes in Low- and Middle-Income Countries. Journal Nutr 2017. 147(11S): 2179S–2187S, https://doi.org/10.3945/jn.116.242321.

Limitations

Our strategy right now is a simplified one, in that we estimate an effect size (with uncertainty) for a generic breastfeeding promotion counseling intervention. We don't, for example, estimate a dose-response. You could revisit the primary sources, and add number of visits to the meta-regression. We did the simplified approach for two primary reasons: first, it was easier, and second, the BMGF wants to know retrospectively the effect of BFP, which is more aligned with estimating the generic effect, not that of each specific protocol.

Current Status and Results

Breastfeeding promotion was the guinea pig intervention that dragged on forever and never quite made it across the finish line, at least partially due to Zane's remote status and waning motivation. It was a goal since August 2018 for it to be CONIC's first publication/ methods paper. Part of my waning motivation was that BFP as we have modelling it is NOT a very good motivation for microsimulation. It does not utilize many/any of the features of a microsimulation model, e.g. risk correlations, individual history, exposure or effect size distributions, etc. Indeed, the results that were last presented to the brain trust were pulled from vivarium's rate pipelines, which means that it was not even really using microsimulation results…. I digress.

The latest model runs (which were quite a while ago, and hence are outdated) were on the zane/bfp branch of ceam_experiments, and were run with the following configurations:

python scripts/distributed_runner.py ceam_experiments/conic/configurations/bfp_cg.yaml ceam_experiments/conic/configurations/branches_bfp_cg.yaml

NOTE 1: there are outdated bfp.yaml and branches_bfp.yaml, this are outdated versions before coverage gap implementation

NOTE 2: It seems that Derrick has been playing around on this branch, for example, I see that he commited changes to bfp_cg.yaml on February 15.

This model used the MagicWandBFP to raise coverage from BMGF_BASELINE_COVERAGE to BMGF_TARGET_COVERAGE

These numbers came from the following chart which was emailed from Rahul Rawat to Abie in November 2018. I do not have any details about what their intervention definition is. It likely doesn't actually align with our intensive 4+ visit intervention, so I don't encourage using these estimates for final models. As per the aux data repo, we set baseline coverage to zero by default (but in this config, it is overridden in the MagicWandBFP component).

The effect size was processed in auxiliary data processing, refer to the above Stash link. For context, see Hub page on Effect Size Meta-analysis, which includes some slides explaining Coverage Gaps.

The results from this run were presented to the Brain Trust.

file:///J:\Project\simulation_science\mnch\Interventions\breastfeeding_promotion\reports\BFP%20Methods%20and%20Results%202018_12_10.pptx

The results in that powerpoint were plotted by the Jupyter notebook attached to the Analyzing Vivarium Results Hub page.

Disclaimer: these results are based on the FinalMortalityObserver and FinalExposureObserver, which are NOT the Observers we want to use for CONIC. They pull rate pipelines, whereas the observers the SEs are currently developing properly track events and person-time.

I never made a true costing component. I did derive a unit cost using IHME outpatient visit costs, then apply it to the number of people treated according to output.hdf.

Next Steps

1) Work with SEs to get MagicWandBFP that properly uses the concept note (e.g. linear scaleup)
2) Work with SEs to get proper observers for all the primary outcomes listed in the concept note