UPDATE 7/7: Thanks again for your review; I made several updates to the CEA based on your comments. More detail below.

Responses to comments:

- **Downward adjustment for prior: I've added a downward adjustment toward Caitlin's prior. I put 80% weight on the New Incentives/IDinsight RCT effect size and 20% weight on the prior. I put a higher weight on the New Incentives/IDinsight RCT because (a) it focuses on the same exact program in the same setting and (b) it's undergone an independent code audit and has had a larger amount of scrutiny from GiveWell staff. The reported effect from IDinsight is 26 pp when I adjust for self-reporting bias. Putting 80% weight on this effect and 20% on the prior of 16 pp leads to a weighted effect of 24 pp.**
- **Vaccine efficacy for PCV: Per Stephan's report, I'm using vaccines' effect on invasive pneumococcal and HiB disease.**
- **Internal validity adjustment for vaccine efficacy trials: I reviewed the meta-analyses for vaccine efficacy. I've adjusted effect sizes for (a) HiB, (b) DTP and (c) BCG, but I don't recommend IV adjustments. This is because, with these adjustments, effect sizes are all based on RCTs. The exception is measles, which has other evidence from serological studies and the mechanism seems fairly well understood, which gives me more confidence, even though effects are based on a combination of RCTs and observational studies. However, the extent of adjustments we include here is likely to make a big difference in the CEA, so I'd be grateful for your thoughts.**
    - **For PCV, DTP, HiB, BCG and rotavirus, vaccine efficacy comes from RCTs.**
        - ***PCV*: Effect size comes from a Cochrane review of 7 RCTs.[1]**
        - ***DTP:* I use the effect from aP, which is based on 2 RCTs.[2] (I was previously using the pooled effect but am choosing this one because it's based on RCTs and is the one used by LiST.)**
        - ***HiB*: I've used the Thumburu et al. 2015 meta-analysis of RCTs using ITT effect.[3] (Previously, I was using a meta-analysis that reported per-protocol effects.)**
        - ***Rotavirus*: Effect size comes from RCTs.[4] Note: I updated effect size to reflect more recent meta-analysis with more RCTs that is now being used by LiST.**

[1] "We identified 11 publications from six RCTs conducted in Africa, US, Philippines and Finland where 57,015 children received PCV; while 56,029 received placebo or another vaccine. Seven publications provided high quality evidence on PCV efficacy against IPD and four provided moderate quality evidence against pneumonia." Lucero et al. 2009.
[2] Table 3, Fulton et al. 2016.
[3] Nine randomized studies were included in the analysis. Pooled vaccine efficacy using a fixed effects model against confirmed invasive Hib disease following the 3, 2 and 1 primary dose schedule were 82% [95% confidence interval (CI) 73-87], 79% (95% CI 54–90) and 65% (95% CI 23–84), respectively, and the overall efficacy was 80% (95% CI 72–85). Thumburu et al. 2015.
[4] Lamberti et al. 2016, Table 1.

        - ***BCG*: Effect size comes from 6 RCTs.[5] Note: I updated effect size to reflect the effect on miliary disease and meningitis, which are the forms of tuberculosis that are life-threatening.[6]**
    - **For measles, the meta-analysis includes a combination or RCTs and observational studies.[7] However, the following additional data points give me a little bit more confidence in taking that effect as given:**
        - **Serological studies seem to find similar effects.[8]**
        - **My impression is measles has been reduced in many countries that have had good vaccination coverage. This is not airtight logic, but gives some additional support.**

      If we adjusted downward the measles effect, this would be balanced out by changing the biomarkers adjustment, since the biomarkers results would be less far off.

    - **Key uncertainties:**
        - **This doesn't take into account *external* validity. Right now, this is all loaded into the lower vaccine efficacy in Nigeria adjustment factor. I calculate it using the biomarkers adjustment, but it may also be worth considering other factors that would influence vaccine efficacy in Nigeria beyond those that we think are reflected there.**
        - **In particular, a lot of studies done a long time ago and not in low-income countries.**
        - **Variation across countries may be due to differences in methodology (e.g., observation studies vs. RCTs, screening of infants with prior exposure to disease), program implementation (e.g., maintenance of cold chain) and vaccine efficacy (e.g., malnutrition limiting vaccine efficacy).[9]**
- **Vaccine etiology: Per Stephan's report, I'm using the View-Hub data for vaccine etiology for pneumonia (% of deaths due to SP and HiB).**

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[5] Mantani et al.. Figure 5. Note this meta-analysis is cited by Plotkin's Vaccines.

[6] "Two forms of TB are life threatening: disseminated or miliar disease, and meningitis." Plotkin *Vaccines*, p. 1098.

[7] A Cochrane review finds an effect of 95% for a single dose at age 9 months to 15 years, though this is also based on cohort studies and includes a much broader age range.

[8] For example: "The proportion of children who develop protective antibody levels following measles vaccination depends on the presence of inhibitory maternal antibodies and the immunologic maturity of the vaccine recipient, as well as the dose and strain of vaccine virus (Figure 3, Table 1). Frequently cited figures are that approximately 85% of children develop protective antibody levels when given one dose of measles vaccine at nine months of age, and 90% to 95% respond when vaccinated at 12 months of age (17). **Among the 44 studies listed in Table 1 in which children were vaccinated between 8 and 9 months of age, the media proportion of children responding was 89.6%. Among the 24 studies listed in Table 1 in which children were vaccinated between 9 and 10 months of age, the median proportion of children responding was 92.2% (mean 88.2; minimum 59; maximum 100; IQR 84, 96).**" WHO 2008

[9] "Generally, the reasons related to low VE estimates can be grouped into 3 broad categories, including (1) issues related to study methods; (2) program-related factors, such as appropriate vaccine storage, handling, and administration; and (3) host-related factors, most notably, age at Vaccination." Uzicanin and Zimmerman (2011) - Field Effectiveness of Live Attenuated Measles-Containing Vaccines.pdf

- **Positive adjustment for cost savings/less lost work time from reduced disease incidence: I've added an adjustment for this in "things left out" and used a value consistent with the SMC CEA.**
- **Positive adjustment for increases in clinic visits: I've included a note on increased clinic utilization but am not applying an adjustment.**
- **Counterfactual value of funds for Gavi: I outsourced this one to Marinella: "Ok, here are some thoughts: (i) using 60% of NI moves the result from 10.6 to 10.4, so not a large difference. I am sceptical of this method for the reasons above. (ii) My understanding that marginal funding to GAVI would go to new vaccines, which are likely to be less cost-effective than RIs for infants. As an example, using current HPV vaccine estimate as a proxy for value of Gavi funding moves the CEA from 10.6 to 10.5. And HPV cost effectiveness is probably an over estimate of cost effectiveness of marginal funding, since GAVI already funds HPV. So I would leave it as it is."**
- **Weighting vaccine efficacy: I fixed this so vaccine efficacy is weighted by share of deaths among *unvaccinated* due to vaccine-preventable diseases, per your recommendation.**

New best guess on CEA is 11x (including "things left out").

In addition to edits based on your comments, I've also made the following adjustments:

- **Rotavirus: I've adjusted the CEA to reflect a 50% chance rotavirus is incorporated into the Nigerian vaccination schedule. I've also used an updated meta-analysis for rotavirus that LiST is using and adjusted % of diarrhea deaths due to rotavirus to reflect the results of that trial (rather than IHME, which I have lower confidence in for etiology data).**
- **Self-report adjustment: I've updated this adjustment (more here).**
- **Partial vaccine efficacy: I've updated this adjustment (more here).**
- **Consumption benefits: I've modeled this out explicitly (more here).**

What I still have to do:

- **Development benefits: I'm in the process of confirming updated development benefits with Stephan. Current best guess is 15%, but I'm not sure about this yet. Previously, I had set development benefits as % of under-5 mortality just based on % of benefits for VAS.**
- **Feedback from IDi and New Incentives: Make any adjustments based on feedback from IDinsight and New Incentives.**
- **Additional CEA adjustments: The CEA does not currently include waste or organizational quality adjustments.**

Thanks again for your thoughtful feedback! I've responded to each of your specific questions below and indicated what recommended action, if any, I plan to take. I'll plan to make updates to the CEA after Stephan weighs in on the vaccine efficacy questions you flagged. What do you think?

New Incentives Review

Background: Thanks for letting me review, this is an impressive piece of work! I kept this to ~2 days, which meant I didn't go deep on anything but just probed the first questions that came to mind on everything. Some of these might not make sense because I didn't connect all of the dots across the model, or with your full context on this literature, and certainly some will not merit action.

I have assumed that this CEA will be used to determine the CE of NI in other areas - that may not be the case based on a couple of your notes. If not, then some of these are not relevant to the current doc, only applicable when we extrapolate to other areas of Nigeria.

I'd really appreciate your thoughts on what was especially useful vs. not very helpful in this review.

What I didn't do: I didn't read the IDi study carefully all the way through, although I read most of it, and I didn't check for typos in numbers in the CEA beyond those numbers that I specifically looked at - mostly the ones discussed below. I also didn't check *all* of the calculations in the CEA. Finally, I saw that there were changes being made to both the model and the document as I reviewed, so those haven't been captured here.

Sorry about that - thanks for dealing with the CEA/writeup that's being updated on the fly!

Comments

Self report bias: I dug into this for quite a while because of the magnitude of the adjustment, including reading some of the literature cited in the footnote and running some sensitivity tests. In the range of adjustments that I thought were reasonable, it didn't change the bottom line. One note though: Banerjee 2010 compared the BCG scar rate in treatment and control groups to mother self-report and found no difference (Table A.3). I'm not sure what to do with that but it seems worth mentioning.

Response: Thanks for flagging this. I wasn't sure what to make of that either. I guess one response is that the context is different so maybe concordance of BCG scar and self-report would be different. But I haven't thought too deeply about it. I'm not planning to prioritize additional work on this.

Recommended action: None.

Partial vaccination. I looked at the new calculations and they make sense to me. I think the approach is cool and impressive. :)

Prior: I have a couple of thoughts on the prior - both indicate to me that we might want to consider a downward adjustment of the estimated effect.

First, I looked at the studies to determine whether this guess was correct: *"Our final, adjusted effect of 30 percentage points is more than 70% higher than this predicted effect. However, this*

includes adjustments for partial vaccination and self-report that we guess are not incorporated into other effect size estimates*."*

Only one of the studies included in the prior[10] used mother self-report, but per above that study (Banerjee) looked at BCG scars and found no systematic inflation of vacc rates in control group vs treatment. The others used biometric or health clinic data (this was based on a quick scan). And they all use full vaccination as an endpoint (for one or all vaccines), based again on a quick read. So, even if we stick with 16pp, we might want to consider adjusting 30pp findings accordingly.

Second, I think the 16pp prior may be biased upward by a study that should have been excluded and by the exclusion of studies that should have been included. I ran a very quick and not very systematic (~20 min, might be important errors, and had to fudge one CI) pooled random effects analysis and found an average of 9pp increase in full vaccination rate, with a positive correlation between baseline rate and children fully vaccinated (studies ranged from 18% to 70% in the control group).

- I used full vaccination because it was the only standard indicator across studies. Kusuma for example found a 7.9 pp increase in full vaccinations, but 11 pp was the highest increase in *receipt of all doses* of any single vaccination.
- I did not fully agree with the included/excluded studies in the prior, so I adjusted which ones were in the analysis, though I only looked at them very briefly and this merits additional work.[11]
- Incentive amounts seemed to vary across programs, but a very quick initial look didn't yield enough data on this to put it into a regression.
    - For reference, NI is roughly $1.3/immunization except $5 for measles. Based only on 2 studies at <$1/immunization, this may be higher than the average amount from other studies

[10] Note that I excluded the study on vaccinations not in children - I also looked at the other studies that I suggest we include in the prior, see next paragraph.

[11]Several studies were excluded due to higher baseline vacc coverage, but in fact BL coverage is not that different from ~60% in the control group for NI (and much closer than, e.g., Banerjee at 6%). I didn't look at all of the excluded studies, but the ones I added back in include:

- Robertson et al. 2013 (Zimbabwe) found a **6pp increase from 70% (ns) in the control group**. Used compliance cards signed when participants accessed services.
- Seth et al. 2018 (India) found an **8.3pp increase from 40% in the control group**. Biometric data used for outcomes. Incentive: USD $0.50 per immunization

I excluded the following:

- Sato & Fintan 2019 (Nigeria) was a study of maternal tetanus vaccinations, currently weighted at 30% - this is the only one no**t** related to childhood vaccinations and is driving the magnitude of the prior. **This was a 25pp increase relative to control. Taking this out accounts for a lot of the difference in the prior.**

The following were already included and I kept them there

- Banerjee et al. 2010 (India) found a **21pp increase from 6% in the control group**. Used mother self-report but did not find differences in discrepancies between self-report and scar between treatment and control groups (higher error rate in the treatment group but ns). Incentive of **~$1 worth of lentils per immunization.**
- Kusuma et al. 2017 (Indonesia) found a **9.4pp increase from 54% in the control group**. Used clinic records. **Unknown $ amount.**

- It may be that the supply side intervention here is very important (see next note). I assume that these other studies also provided supply side support, but that may not be the case.

Response: I think this is a good point. In this case, I feel alright putting a fairly high weight on the New Incentives results, since they're for the specific program in the specific country we're considering funding, but I agree a weight of 100% probably isn't right. My current adjustment for self-report is smaller - best guess is 26 pp effect size vs. 30 pp - so that brings it a little closer to the prior of 16 pp, for whatever that's worth.

Recommended action: I'll plan to apply a downward adjustment to reflect difference from the prior, though I don't plan on digging back into Caitlin's prior calculations.

Supply side: WRT external validity, do you have thoughts on whether NI will be able to maintain vaccine supply chain support at a larger scale with the same level of intensity as they did during the RCT?[12]

This seems important: The literature on stockout rates in Nigeria indicates that they are an important barrier to vaccination, and particularly bad in low-vacc-coverage states.[13] The stockout rate implied by NI in their conversation notes appears lower than stockout rates in the literature, though not directly comparable (6% stockouts for NI immunization days vs. ~80% vaccine stockouts over a given month in Nigeria in general). Presumably the reason for this is that part of the effect of the intervention is through supply chain support, though CCTs may also incentivize "catch up" after a stockout, mitigating the importance of the supply chain.

Response: We're still deciding whether to fund just the continuation of the program vs. scale-up. With scale-up, there are a few questions we'll need to sort out, and I think this is one of them.

Recommended action: I'll ask Marinella for her thoughts on this.

MC thoughts: it's a great question, and we don't have a definitive answer. Some reasons to think this is not too worrying (i) a lot of the work they do is about improving the vaccine supply flow (from national to local). This includes work at the LGA/state level, so they have an infrastructure already set up for when they scale; (ii) there's some reason to believe NI supply support might *improve* as they scale, as they'll be able to gather more

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[12] New Incentives 2017 conversation notes: "Supply-side monitoring, as well as clinics adjusting to changes in vaccine demand, seems to have reduced the frequency of vaccine stock-outs. Of the 109 "immunization days" that clinics hosted in July, there were six instances of a clinic running out of a vaccine in the middle of the day and two stock-outs; this is fewer stock-outs than there were during New Incentives' initial work at its learning sites."

[13] Gooding 2019 Impact of vaccine stockouts in Nigeria: "We find that when vaccine stockouts occur at Local Government Area stores in Nigeria, they significantly decrease the number of children immunized, and for most vaccines, the effect lasts for several months after a stockout. Some of the demand lost when a stockout occurs is recovered over the following six months as children catch up with the regimen. The magnitude of the impact varies across different vaccines."

Sato 2019 Vaccine stockouts and vaccination rate in Nigeria: "The prevalence of vaccine stockouts in Nigeria is high: 82.7% between 2012 and 2013. We find a negative correlation between vaccine stockouts and vaccine take-up. However, we observe the differential correlational pattern depending on the regional vaccine coverage, which we consider as the proxy of the level of demand for vaccines."

Kusuma 2017 (CCTs for vaccines): "In terms of inadequate supply-side, our baseline data show that 19% of health centers in treatment areas experienced stock-outs of at least one vaccine type the previous two months."

comprehensive/representative data and help LGAs/states predict demand; (iii) NI might decrease the bad effect stock outs have on demand - both because of the CCT and because NI gives caregivers a numbered tag that gets them served first on the following immunisation days.

Measures of vaccine efficacy. I'm uncertain why one would use efficacy against invasive disease for HiB and PCV when both present measures of efficacy against clinical cases of pneumonia/meningitis, and in the cases of the other vaccines you are using efficacy in preventing clinical cases. E.g., PCV is 6-27% effective against clinical pneumonia compared to 58% for invasive disease (Lucero et al 2019, per your footnote). HiB vaccine is 4-13% effective against clinical pneumonia for HiB and 88% effective against HiB-caused meningitis versus 93% for invasive HiB (Griffiths et al. 2012, fig.4). *[I asked Stephan and he said he was already looking into this as a potential issue. He will get in touch with you after some investigation of the papers. BTW, he is also going to look into the CEA briefly with a focus on efficacy measures used, so can probably add more value there.]*

Response: This is a good question and definitely worth digging deeper on. I used invasive pneumococcal disease and invasive HiB disease, since that's what the LiST model uses. I then adjust downward deaths from pneumonia to include only the share attributed to streptococcus pneumoniae and HiB. If we were using effect on clinical pneumonia, then we presumably wouldn't need to make that downward adjustment based on etiological share for SP and HiB, so these could balance each other out (at least somewhat).

Recommended action: I'll make adjustments once Stephan shares his recommendation.

Also, based on a quick look, it is my impression that the studies used in the BCG, measles vaccine,[14] and whole-cell DTP vaccine efficacy meta analyses are all based on observational evidence. Why not apply an IV adjustment to account for the likely overstatement of vaccine efficacy resulting from selection bias? I would point for example, just because I was looking at it for ACM and not because it's the best yardstick, to the Higgins 2016 estimates of BCG's impact on ACM: RR of 0.7 for clinical trials and 0.47 for observational studies (abstract).

Response: I decided not to dig deeply into the meta-analyses for the different vaccines. I think there's an argument to be made for going deeper here, but I'm not planning to prioritize this right now.

Recommended action: None.

Do you think that improving general health (and availability of things like ORS) since vaccine effectiveness studies were conducted may reduce the impact of vaccines on health? Should there be an EV adjustment here to account for this?

Response: My initial thought is no. I'm modelling the effect as vaccine reduces likelihood of the disease and then reduces likelihood of death based on share of deaths caused by that disease. Improvements in health would presumably be captured in the share of

[14] For measles, 1 out of 13 studies was an RCT.

deaths caused by that disease, and my impression is that vaccines' effect on likelihood of having the disease itself would not be affected by general health.

Recommended action: None.

Vaccine efficacy. Should this be weighted according to p(death) in unvaccinated children?

Response: That's a good question. I'm not sure.

Recommended action: I'll check the calculations and see what the appropriate approach is.

Non-specific effects of vaccines. I thought about this briefly and read the Wikipedia page and the WHO page on this. Per Wikipedia, DTP and Hep B can have a negative NSE which appears to be negated by the other live vaccines once they are administered. It also sounds more generally like the non-specific benefits of one vaccine are negated/lessened when the next vaccine is administered. As an example, this article seems to imply that having measles as the most recent vaccine is highly beneficial due to the NSEs of MV in particular.[15] If that is true, probably should not be summing non-specific effects across vaccine types but just using MV (plus potentially reduction in NNM due to BCG[16]). Also implies that your downward adjustment for increased mortality risk from DTP might be too large, given that most kids will have it before MV.

Also, per WHO, "The existing epidemiological and immunological data on heterologous effects of vaccination are drawn from studies with a high risk of bias, use vaccine schedules that are no longer implemented, and have no causal linkage." (pg. 2) So might want an IV adjustment here as well, in addition to an EV adjustment due to improving health situation in general (per your note).

Response: I'm highly uncertain about the non-specific effects piece. There's a lot of rambling about all-cause mortality in the report, but to your points:

- **I'm not summing all-cause mortality but setting an adjustment to the overall all-cause mortality effect of the entire regimen of vaccines to be similar to what we do for the SMC CEA: 1 death directly averted from receiving all vaccines = 0.5 deaths indirectly averted.**
- **This leads to an all-cause mortality RR overall of 0.82, which is still weaker than the all-cause mortality RR from BCG (0.7) and measles (0.74) alone. (If we summed best guesses on all-cause mortality across vaccines, then we'd get something lower than 0.7. Like you said, this probably isn't a good idea for a few reasons, including some vaccines having non-specific effects on diseases prevented by vaccines and improvements in health over time.)**

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[15] "However, increasing evidence indicates that vaccines have non-specific effects (NSEs),2 affecting the overall health of the child beyond preventing target infections. These effects are strongest as long as a given vaccine is the most recent vaccine" Fisker & Thysen 2018

[16] "The 2 trials combined show that the neonatal mortality rate ratio was 0.52 (95% confidence interval: 0.33–0.82) when BCG was given at birth to low birth weight babies" Shann 2012, though this is commentary and would need to be vetted

- **I'm highly uncertain about this. Benchmarking with what we do in SMC seems reasonable, but I'm not sure.**

Recommended action: None.

Other benefits of vaccines. Do you expect that the program leads to more well child visits overall? This could be a pretty significant positive externality.

I know we don't typically do this, but especially in such a wide ranging vaccination program, should we consider including some scalar to upward adjust due to the consumption benefits families achieve by averting the need to care for a sick child? A study in Taiwan found that IPD was associated with a cost of "approximately 27%–81% of the monthly salary of an unskilled worker." (Ho et al 2015) I started looking at rotavirus estimates and realized quickly that this was probably a not super helpful rabbit hole, but the down arrow was that rotavirus is also costly to families. So, if you assume that parents on average spend the equivalent of one week per year of time and/or salary dealing with preventable diarrhea/pneumonia/other non-specific things helped by vaccines, that doubles the total value of the program in terms of consumption (just divided consumption from Caitlin's BOTEC by 52). That may ultimately be way too high, but based on a parent gut check, it doesn't seem crazy.

Response: I think this is a good idea and probably something we should consider including in other CEAs, but because we don't, I feel reluctant to include it in this one.

Recommended action: None.

What do you think about including development effects such that changing moral weights inputs would change the % attributable to these effects? Also, it appears as though the current estimate for VAS is 35% of the effect on mortality reduction and 41% for malaria?

Response: Andrew and Stephan had just updated the development effects, and it's on my to do list to incorporate this.

Recommended action: I'll update development benefits, based on reviewing the revised adjustments for VAS and SMC.

Costs. I'd imagine that costs would go down as New Incentives scales.

Response: My understanding is that we've been reluctant to include scaled costs in CEAs in the past, but I'll confirm with Marinella on that, since she's the costs guru.

MC addition: Yes, historically we have not assumed costs decrease at scale unless we have a specific reason to (e.g. there's an initial fixed investment).

Recommended action: Check with Marinella.

Leverage/funging. I know James looked at this so I'm probably wrong/misunderstanding the sheet, but I thought we were assigning Gavi/Global Fund cost effectiveness of ~60% that of AMF, or something like 0.027 units of value per dollar.

Response: The values we use here are similar to the AMF CEA. See the section on "Counterfactual value of government/Gavi costs spent on vaccinations" in Marinella's costing analysis here.

Recommended action: None.

Biomarkers results. Based on the worksheet, it appears that you would bet that the bad biomarkers results are due to a cause that is an existential threat to the success of the program. These results are more applicable (versus the other results cited) to the specific challenges right now in NW Nigeria, in the context of NI implementation (including NI supply chain support). I think an outsider would look at the final adjustment and find it optimistically over-weights results that may not extrapolate to the NW Nigeria/NI situation. This is just based on a quick read of this, and I know you've thought about it a lot, so I don't want to overstate my position.

If you stick with this adjustment, it might make sense to think carefully about how to continue to monitor this in an ongoing way if we renew NI funding, for example by monitoring biomarkers and/or disease prevalence in a sample of communities. Just assuming it away doesn't feel like the right response to these results. I know this is a broader issue, just wanted to note that it would feel weird to me for this adjustment to be the final thinking we do on these results.

Response: I think this is a fair criticism, though it was also a pretty small study. We are considering some follow-up work to test vaccine efficacy using serological markers, and I agree this should be noted.

Recommended action: More clearly note in the draft that we plan to pursue follow-up studies to check on vaccine efficacy.

Spillover effects/costs of crossovers. Just a small note that I'm not sure that spillovers would necessarily increase the impact of NI, I think it would depend on the profile of those who are able to travel to neighboring areas. This applies to the cost section as well - it seems likely that better-educated and more likely to vaccinate families would find out about and travel for vaccines. But that's speculative and mostly based on my knowledge of 1AF findings re: those who traveled to neighboring districts.

Response: The concern was more about whether the control group includes a large share of infants who were enrolled in New Incentives (i.e., traveled to treatment clinics to get vaccinated).

Recommended action: None.

Negative/offsetting impacts. What do you think would happen if New Incentives left? Would vaccination rates potentially fall to pre-NI levels, or lower?

Response: Marinella's offsetting/negative effects write-up includes a potential for "crowding out of other motivations for vaccinating children." Was that your concern? I didn't do a great job syncing those up with my report.

Recommended action: None.

Use of percentage point change. I know that James also noted this, I just want to second that we should think carefully about this. And, do you think the CEA should be more broadly applicable, including beyond the specific areas of Nigeria where the RCT was conducted? IMy impression is that the results will be used more broadly than just in this one setting- Is that right? I may be misunderstanding the next steps on this.

Response: I agree this is probably worth further thought. I've put a 10% downward adjustment for crowding out of New Incentives due to increases over time in clinics near where New Incentives is currently operating. If we were adapting this to other contexts beyond North West Nigeria, we'd want to include further adjustments.

Recommended action: I don't plan on prioritizing this right now but will note that the CEA applies only to situation where New Incentives expanded to clinics similar to those in the RCT.