Environmental Health Tracking and Biomonitoring Advisory Panel Meeting Summary

Date: 10/08/2019
Minutes prepared by: Kate Murray
Location: American Lung Association in Minnesota
490 Concordia Ave, St. Paul, MN

Attendance

- Panel members: Kristie Ellickson, Minnesota Pollution Control Agency (MPCA); Farhiya Farah, St. Mary's University of Minnesota; Tom Hawkinson, Wenck Associates; Jill Heins Nesvold, American Lung Association in Minnesota; Ruby Nguyen, University of Minnesota (UMN); Geary Olsen, 3M; Tracy Sides, Public Health Law Center; Cathy Villas-Horns, Minnesota Department of Agriculture (MDA); Eileen Weber, UMN; Lisa Yost, Ramboll
- MDH Staff: Michelle Gin, Environmental Health Division (EH); Carin Huset, Public Health Laboratory (PHL); Jim Kelly, EH; Tess Konen, Environmental Epidemiology Unit (EE); Mary Manning, Health Promotion and Chronic Disease; Paul Moyer, PHL; Mary Navare, EH; Jessica Nelson, EE; Kate Murray, EE; Stefan Saravia, PHL; Deanna Scher, EH; Jessie Shmool, EE; Dan Tranter, EH
- Guests: Brenna Doheny, UMN Medical School; Yuko Ekyalongo, Child Trends, formerly EE; Andrea Jordan, UMN School of Nursing; Raj Mann, MDA; Kari Palmer, MPCA

Preliminary Healthy Kids Results: 1-Nitropyrene

Jessica Nelson, MN Biomonitoring, presented preliminary 1-nitropyrene (1-NP) results in Healthy Kids participants. For more information on this topic, please refer to this section in the October 2019 Advisory Panel book.

Discussion

Ruby Nguyen asked how old the kids were. Jessica Nelson responded 3-6 years of age but noted that participants skewed older (due in part to the eligibility requirement that kids be potty-trained for ease of sample collection). Nguyen asked if the very high outlier, who was from a rural county, was a minority child. Nelson was not sure but did not believe so, although there were some Spanish-speaking participants in the rural counties. She also pointed out that this was a univariate analysis and that race/ethnicity had not yet been considered.

Jessica Nelson mentioned that California's state biomonitoring program is working on diesel emissions and air/health concerns. Many of their analyses correct for creatinine levels, but she will need to investigate if such a method is appropriate for child participants. Compared with the California studies, Healthy Kids' geometric mean was three times higher. California's maximum detection level was also much lower.

Geary Olsen pointed out the extremely low detection level (looking at parts per quadrillion) and that implications would be hard to communicate to the public. He asked about the toxicokinetics of something so close to zero: "What will the public gain? What questions are they going to ask?" Jessica Nelson stated that the team had yet to turn the results into any sort of narrative or messaging, but that they would be very careful to say that with the exception of a few of the metals, these are markers of exposure, not an indication that the child's health will be affected, and that results would be part of a much larger picture of possible sources of exposure and risk factors for diesel exposure. Much time is being spent on the results return letters and tables. She acknowledged that environmental health literacy is challenging when looking at individual results, especially with the family of the outlier case, but that this was part of a larger group analysis overall and not so much about individual cases. She reiterated that the results are still valid and useful from a biomonitoring perspective.

Lisa Yost mentioned the high frequency of detection (Jessica Nelson confirmed that it was around 97%), and how that reflected the extremely low threshold of detection. She felt that while this is a better biomarker than a previous analyte that could be confounded by diet, she wondered what this is really telling us: "If we virtually all have some in our bodies at that level, how do we link it back to what we want to link it back to?" Nelson responded that within the high detection rate, there is also quite a bit of variability – for instance, the 95th percentile is a whole order of magnitude above the geometric mean. She pointed out that 1-NP is measured as a continuous variable, not just "detect or not detect," and that they expect the detection frequencies to get greater as the methods get better. This is part of why they also have surveys with the studies and are seeking to add the GIS variables.

Jessica Nelson also brought up the focus groups that were used to help evaluate the Healthy Kids results tables and letters. Those participants found that putting their individual results next to the community results for comparison (be it other rural groups or communities in north Minneapolis) provided helpful context, even if the information wasn't about health effects or a particular exposure source.

Carin Huset added that there is only one lab (in California) that tests for this metabolite, so that helps strengthen the comparisons, but that we may see some shift as they improve their methods. Nelson agreed, and pointed out that comparing detection frequency between studies warrants caution because of the evolving methods.

Stefan Saravia asked about the outlier, wondering how comparisons with San Diego's data would change if that case was excluded. Jessica Nelson clarified that the comparison was done with the outlier excluded. She elaborated that the reason they use a geometric mean instead of an arithmetic mean is to help account for outliers like those, and therefore there were minimal differences when the outlier was excluded versus included. She stated that geometric mean was not far from the median.

Kristie Ellickson asked about the scatter plot with the 6- metabolite and 8- metabolite, and whether there was insight to gain from the points lying away from those, or if that broader scatter was expected. Jessica Nelson said she didn't see a reported correlation in the literature but that some variability was expected, and that overall, this plot was actually pretty tight. Carin Huset thought the outliers were possibly due to detection issues.

Yuko Ekyalongo clarified that the only GIS data she had incorporated was actually around traffic density and not distance to nearest road. It was too hard to define the roads as highway, etc. She hoped there would be more granular data available down the road. Jessica Nelson mentioned that there was a survey question about proximity to roads but that they didn't do well enough to define what constituted as a busy road. Kristie Ellickson added that that was a limitation of the rural census blocks, which each have only an average traffic density but can vary so much. It would be best to compare both a density and a proximity, and those methods do exist. Without that information, it's hard to compare rural and urban areas. Tom Hawkinson added that kids who live on working farms will have much higher local exposure to diesel from farm equipment, which may be more important than proximity to road-related exposure.

Health Equity Data in VW Settlement Grant Evaluation

Jessie Shmool, Environmental Epidemiology Unit supervisor, presented on evaluation methods and next steps regarding the Volkswagen settlement. For more information on this topic, please refer to this section in the October 2019 Advisory Panel book.

Discussion

Jessie Shmool: We talk a lot about health equity but not how we operationalize it. We're grateful for the MPCA's openness to including something new, especially in such a tightly-regulated progress around the settlement. We would like feedback from the panel on the scoring. We would also like to know if others have experience using health data in Requests For Proposals (RFPs) and evaluation. MPCA used an inclusive, stakeholder engagement process all over the state and found consistent interest in Environmental Justice (EJ) and health impacts. This was motivating to us: a chance to "give the people what they want."

Mary Manning: What was the score for Hennepin County?
Jessie Shmool: We analyzed the Metro by ZIP code.

Tom Hawkinson: Do we have some understanding of the north-central stripe that's high? Is it the Native American population?
Jessie Shmool: We have a fair amount of vulnerability (and COPD, other conditions) in rural areas. We haven't tied it back to race/ethnicity data and we don't get Indian Health Services data, so we wouldn't be able to directly answer that. In Greater MN, there was a fairly low correlation with EJ and health; it was higher in urban areas, as expected. As far as representation in the awards: In Greater MN, 56% of awarded grants had indicators of preterm birth; in urban MN, 71% had higher emergency department visits due to asthma. We saw clear evidence that it's good to use multiple indicators.

Jessie Shmool: There is consensus with MPCA that we are going to keep the construct narrowly defined as conditions that are influenced or exacerbated by air pollution, so we're not in a space to expand that to include other things, but we have had some suggestions to tweak this indicator. I'm really interested if you have any feedback or suggestions.

Lisa Yost: How broadly… who have the applicants been? Do people understand that the funds are available and how they apply?
Jessie: Yes. MPCA did a lot of outreach and provided opportunities for technical assistance to the applicants. The availability of these funds has been, I think, more widely broadcast than standard RFPs overall. They don't tend to have a lot of public meetings around RFPs, but they certainly have for this. They still want to do better to make sure they're attracting applicants from across the state, but it's not a seen limitation from phase 1.

Lisa Yost: My other question is about the difference between phase 1 and phase 2. What's the impetus for changing for Phase 2? How is it different?
Jessie: Phase 2 is not necessarily different, it was just an opportunity for MPCA to evaluate, see how things are going, look at how well they are doing to meet emissions reduction goals. There has been discussion about including points for greenhouse gas reduction. Phase 2 was built in really to evaluate and make changes as needed. It was a big undertaking from the Federal awarding agency. There were a lot of administrative and legal requirements. But it's a nice opportunity for us to evaluate as well.

Jill Heins Nesvold: Thanks for considering including Chronic Obstructive Pulmonary Disease (COPD) as one of the indicators. I'm not surprised that you didn't – disappointed, but not surprised. I'm guessing that's because it's consistently riddled with coding problems (Jessie Shmool: right.). You were looking at asthma from the emergency room perspective, and COPD cannot be diagnosed in the emergency department because they lack the equipment. In most cases, so does primary care. That's one of the problems with the whole coding perspective. We do at some point need to understand that and do a better job, otherwise it will never be included as a health indicator. I would welcome that discussion with you ahead of the next time and help you understand how to address the coding issue so you can include it in the future, because I think you're missing it if you're looking at it as an emergency department issue. You're never going to find it.
Jessie Shmool: For our routine annual surveillance of COPD, we do look at in-patient hospitalization. Would you say that the coding is more precise?
Jill: No, I'd say you're still missing about half – 50% of people aren't diagnosed until their first severe exacerbation puts them in the hospital. And then usually the hospitalist doesn't get confirmed day until day three. By then they've already got a host of other primary and secondary diagnoses codes to keep them in the hospital to trigger Medicare reimbursement and keep them in the hospital, so you've already missed the boat. You're probably going to find them with a primary diagnosis of lower respiratory failure and the like, so you have to take a different approach to defining them when you're looking from a hospital perspective. You're capturing them, but you're probably grossly underestimating the rate.
Jessie: We'll follow up on that.

Mary Manning: I really empathize with that, and we as an agency really do too. I think it's a big shortcoming of the amount of data that the Department actually has access to. It would be a big burden on the hospital systems also. But you're talking about hospitalizations – the only way we get chronic disease data is from administrative/billing areas of hospitals. We're just starting to get it from all payors claims database, and we don't even have total access to that. We would need a different algorithm for COPD is hospitals, but we'd still be missing all the

people diagnosed in clinic and any other facility. All diseases except cancer are not reportable to us. As we look at quality data and what people want, we need to remember this in conversations with legislators. We really don't have a good handle on this. We get a little more from death records but there are huge gaps in incidence data, especially considering that this is becoming a third and fourth leading cause of death in Minnesota and how much this disease impacts quality of life.

Mary Manning, continued: But I did want to ask a question after offering that clarification: Are the replacement vehicles marked in any way? Do communities have any idea that they're part of the settlement? Is the community asked for any input into the grant/do they require community support?
Jessie Shmool: Those are questions for the MPCA. The money has only been out the door for less than a year/6 months. That would be really cool to see a bus with some sort of signage. In terms of community input on process, MPCA really tried to do that upfront to understand which issues were important. For example, MPCA's data shows that for a school bus, whether a replacement or a retrofit, the amount of emissions reduced compared to the cost is actuaully less than other some other heavy-duty vehicles, but that was something really important to communities because of the amount of idling and how much time kids spend on them. That was one way they tried to include community priorities. It's a very big program to administer.

Eileen Weber: How much of the money is left for phase 2?
Jessie: I think they still have around two-thirds remaining. They learned a lot of lessons. Compared to other states, where anecdotally, 10 guys went into a room and decided how to spend the money, they've really done a lot of work to try to be as transparent and thoughtful and inclusive as possible.

Radon Project Summary

Tess Konen, MN Tracking, summarized a recent analysis of disparities in radon mitigation. For more information on this topic, please refer to this section in the October 2019 Advisory Panel book.

Discussion

Deanna Scher asked what we know about schools and mitigation. Tess Konen said that the current data doesn't always offer a clear picture. Eileen Weber mentioned that a group of students from the law school at the University of Minnesota is working on this. Tess confirmed that MDH has been working with them and hope to help inform their work.

Jill Heins Nesvold asked where she could get information about the data sources. Tess Konen said it was shown on About the Data tab on the portal, which also explains rate calculations, lets the user search and download the data, and more.

Tess Konen added that while there were not many surprises in the findings, it helps having concrete data for groups to use (like the law students). This data can also help inform targeted awareness campaigns to increase testing or possibly let people know about assistance with

mitigation. Additionally, in November MDH will present at a number of partner meetings to help disseminate the findings and hopefully inform strategies for the partners' outreach efforts. The next steps for MDH will be wrapping up the analysis and packaging it in such a way that it can be used to help push the envelope around improving situations for populations like renters. Dan Tranter added that MDH is also partnering with the Breath of Hope Lung Foundation, who are applying for grants that would subsidize low-income mitigation.

Lisa Yost said that this is important, interesting work with a clear end point, and that there's not even a "bad guy." She asked if are there any states that are doing better than we are in terms of getting/requiring mitigation, especially among landlords who need to get an inspection. There's currently no enforceability. She asked if landlords could at least get a flyer at the point of inspection to let them know how easy and affordable the testing was. She also asked about Section 8 housing landlords in particular, and whether there are revenue streams that could exist for them since their renters are often the ones living in the basements where exposure tends to be highest. Eileen Weber mentioned that there was a successful model and fund in Minneapolis for dry cleaners to help mitigate their own PERC problems. Minneapolis became the first city in nation to eliminate PERCs from their dry cleaning industry. Tess deferred to Dan Tranter, but thought that Minnesota was possibly doing better than a lot of states in terms of awareness. Dan said that there is a bill introduced that's still active that would require testing and mitigation on rental properties, but it didn't go anywhere during the last session and is likely a long shot.

Lisa commented about how testing is so easy, and that if landlords are already legally bound to install egress windows and the like, they might as well put in the mitigation system. Dan Tranter commented that the Landlords Association is very much against it, adding that mitigation systems can cost more in multi-family units, and also that they are required to be installed by a licensed professional. He posited that a requirement for disclosure, as is the case with home buyers, would probably be more successful than a testing/mitigation mandate.

Tracy Sides highlighted the poverty tab, and said that $1500 was a lot of money for those families to mitigate. She also reminded people to be thinking of equity during awareness campaigns. Sides thought that home nurse visiting programs and community foundations concerned about housing might also be interested in this data.

Farhiya Farah said she agreed that the disclosure requirement would be more low-hanging fruit and could very well follow the success of the lead programs, which has contributed to significant exposure reductions. She also asked how MDH had captured the mitigation numbers. Dan Tranter responded that as of 2009, mitigation companies have to report to MDH. Not all are licensed, but rates are improving with policy changes.

Stefan Saravia asked if MDH was able to see the number of mitigations per radon level. When do people decide to act? Dan Tranter responded that people with readings around 4.0 pCi/L (the threshold) often choose NOT to mitigate. Often takes a level of 8 or 9.

Farhiya Farah asked whether measures to reduce radon are required for new home builds, and if building techniques have improved. Dan said that yes, as of 2009, better materials and techniques are required, but they only reduce the radon by about 40%.

Eileen Weber said that the aforementioned law students are working on advocacy piece, but she wasn't sure if it was just for schools or if it included low-income homes. Dan Tranter clarified that their goal is to require landlords to use licensed testers.

Deanna Scher expressed concern about doing outreach in such a piecemeal fashion. She observed a lot of overlap with private well users: 20% of households use private wells and there's nothing that requires landlords to test those wells for arsenic, nitrates, bacteria, or even to disclose that it's there. It's another area in which renters are at a disadvantage. She cited it as a good reminder to keep thinking holistically about these environmental health issues.

Biomonitoring Grant Award and Program Expansion

Paul Moyer of the MDH Public Health Laboratory presented on the recent CDC grant and plans for expanding the Biomonitoring program statewide. For more information on this topic, please refer to this section in the October 2019 Advisory Panel book.

Discussion

Paul Moyer stated that a CDC site visit would be happening in February and overlap with the next Advisory Panel meeting. Jessica Nelson asked which topics would be useful to bring up to a CDC expert (possibly Antonia Calafat/NHANES person) while they're here. Tom Hawkinson replied that if they've done studies that connect the dots between our metrics and data and the health implications, it would be great to hear about it. Lisa Yost added that even if they can't get us all the way to epidemiology, it would be helpful to get broader context, such as how it fits with the other data. Paul Moyer responded that one reason CDC encourages use of the NHANES methods was to bolster comparisons with national numbers, but there's still the question of "so what?" Carin Huset noted that some states do make changes to their list of analytes, but that CDC can provide more technical assistance if we stick to their methods.

Jessica Nelson then presented on recruitment and sampling strategy. For more information on this topic, please refer to this section in the October 2019 Advisory Panel book.

Tom Hawkinson: Even if you have a well-designed study, you'll have a failure rate. The participation rate can make it seem like a convenience study.
Geary Olsen: So what would you describe the Healthy Kids study as?
Jessica Nelson: We didn't do weighting in that study like we will with this one. I'd say population based, because we had a defined time window. Would cost ~$12M/yr to replicated NHANES on a state level (CA estimate) so that's not feasible for a number of reasons. We're not trying to get someone from every ZIP, more so looking for representation of different races and ethnicities, genders, social economic status, languages, etc. Each region isn't meant to represent the entire state. Compiling them will allow us to weight them.

Jessica Nelson stated that MDH was still deciding on the order of regions/counties. It doesn't matter from statistical perspective because they're sampling with certainty, though she will likely need to defend this (i.e. some counties who have expressed concerns about exposures in the past will wonder why they're not picked first). They are also deciding on subsets of counties

(3-4 counties within each region) but plan to randomly select 4 from those eligible (based on who administers ECS screenings).

Eileen Weber: In some parts of greater MN, county Public Health has merged (public health boards), so if they are already collaborating, does getting one count as getting them all?
Jessica Nelson: That will depend -- not automatically, but would help with contracting, etc. Still needs to be county-based sampling.

Jessica Nelson asked for feedback about a target number of kids recruited per county per month to avoid bias.
Mary Manning pointed out that life is different for families early in the month.
Kristie Ellickson: Are appointments the norm? How often do those schedules open up?
Jessica: Yes, but they don't have the full list ahead of time. We could sample from the last part of the month or switch to different weeks.
Ruby Nguyen: These points have been important in my projects. We rely a lot on the data collectors to tell us about the logistics. Age selection matters too. We can help answer these, but I've started with the local partners/data collectors first. Understand the process from an ECS administrator perspective.
Lisa Yost: Sounds like time could be important (paychecks, responsibilities), and that the beginning of the month could be challenging. Time of day could also matter. Skip around with that as well.
Ruby: Another study showed the workload is different throughout the day for data collectors, so incorporating extra collection early in the day wasn't always possible.

Tracy Sides: Can you comment on differences in gender, race, etc. in Healthy Kids and lessons learned that we should apply?
Jessica: We didn't look at those demographics but it would be good to do so.

Questions for the Advisory Panel

Question 1: Should we combine down to 4-5 regions/groups of counties? Then we can cover more area, shorten the time interval for resampling, and make statewide estimate more valid. Disadvantages: might be less representative.

Geary Olsen: Is your limiting factor collecting samples or analyzing in the Lab? You do need to worry about time-dependent changes in exposure. I think you need to condense the collection timeframe. You can archive lab data for analyses.
Jessie Shmool: we have been thinking about logistics as a limiting factor. It was a lot of work to coordinate work with White Earth (2 years and counting). We do have some State resources that could supplement this if we needed more kids per region, but we have staffing limits, etc. There are boundaries for what we can logistically do.
Geary: Like everything, you're compromising one way or the other way.
Lisa Yost: Seven years seemed long to me as well. As you combine areas, will there be new logistical barriers (multiple leaders, etc.)?
Jessica: No, these are just labels from SCHSAC.

Ruby Nguyen: Is this fewer counties sampled? If you reduce regions but keep same/increase counties, how does that change the timeline?

Jessica: It would be fewer counties to represent larger areas. We'd get back to the regions sooner (in year 6 instead of year 8).

Lisa: One challenge with fewer groups is getting at the diversity of communities. You might have a tribe, agricultural area… Don't know how to fix that but we need to account for it.
Kristie: I'm thinking about that geographically for agricultural areas, or certain geologies that might affect exposures.
Jessica: I'm generally hearing support for combining if we can figure out the wrinkles. Anyone have a problem with combining them?
Lisa: Does it have to be through the county?
Jessica: It has to be through ECS because that's how we get the list of kids. If you have additional thoughts, please let us know.
Jessie: We are very committed to making this program permanent, so we've already started thinking about how we can have a strategy now to secure statewide and CDC funding (the latter has funded two cycles in the past). I think shortening the timeframe has other scientific merit as well.
Eileen: If your goal is to make it representative of the state, you need to consider the whole state. Especially for legislators.
Kristie: Some of these analytes are going to be dynamic over time. Some will drop off the market (flame retardants) while others will be around for a long time (arsenic).

Question 2: What about the sampling plan to select counties/school districts? Developing the recruitment plan?

Tracy: For the second one, is the Center for Public Health practice an appropriate resource? They have a strong grasp and capability for working with people with diverse backgrounds.
Jessica: Haven't worked with them, but this is in-line with wanting to work with LPH because they know these communities.
Jessie: Also Ann Kinney is in SHIP and coordinates with a lot of LPH, so having her expertise will help.
Lisa: If it is an ongoing plan, is that thinking that once you select counties, would they get resampled?
Jessica: I think we would random sample every time.
Lisa: You still have to account for diversity somehow if you're only going to get three counties.
Jessie: We might have to categorize within the region in some way and select from there.
Jessica: At least we'll know when it's not perfect (census data, refusals, etc.). We're also limited by the 6-month sampling window. I will ask LPH about when that should happen.

Jessica Nelson: Any thoughts on categories that we're thinking of for representation categories? Gender, race/ethnicity, education, SES?
Lisa: Rural/urban within a county.
Ruby: The language one seems tough to capture.
Jessica: California did English at home or non-English.
Brenna (audience member/guest): Different months might need different weeks (holidays, etc.).

MN Tracking Updates

Due to time constraints, this topic was not presented or discussed. For more information, please refer to this section in the October 2019 Advisory Panel book.

MN FEET and MN FEET Clinic Updates

Written updates were provided for this topic in the October 2019 Advisory Panel book.

Public comments & audience questions

Discussion did not bring forward any additional public comments or questions.

New business

Discussion did not bring forward any new business.

Motion to adjourn

The meeting was adjourned on time.

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02/05/20

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