Written Testimony: MDEHR – Environment and Transportation Committee

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Dear Members of the Environment and Transportation Committee and Committee Chair Delegate Barve. Thank you for the opportunity to speak with you today.

Our names are Laila Reimanis, Maureen McClellan, and Pedro Polanco. We are Master of Health Sciences candidates at Johns Hopkins Bloomberg School of Public Health in the Department of Environmental Health and Engineering. Prior to pursuing Master of Health Sciences degrees, our backgrounds range from business, medicine, and environmental policy. We, along with several of our peers, worked with the Maryland Environmental Human Rights Campaign to create an economic analysis of the costs associated without an adoption of an environmental human rights amendment in Maryland. We focused our analysis on the costs of inaction associated with physical harm from air quality and the costs of children's mental health. Our collaboration with the Maryland Environmental Human Rights Campaign was completed as a practicum project in our Applied Environmental Health Practice course.

Our testimony today will address the financial burdens that Maryland incurs without an environmental human rights amendment, methods and assumptions for our cost analysis, and the implications for Maryland's future.

Environmental Human Right Amendments Background

Since 1970, 7 states have passed legislation to ensure that their citizens have the right to a healthy environment. This includes Pennsylvania, Montana, Illinois, Hawaii, Massachusetts, Rhode Island and most recently New York.[1] An environmental amendment awards the state and its citizens the role of good stewardship under legal authority in maintaining resources such as clean air and quality water. In protecting the right to a healthy environment, legislators place

[1] Williams, K. (2021, November 1). *Fundamental Environmental Rights: State Constitutions as a vehicle of change*. Jurist. Retrieved February 20, 2022, from https://www.jurist.org/commentary/2021/11/kirsten-williams-environmental-rights-amendments/#:~:text=Since%20the%201970s%2C%20political%20branches,followed%20by%20Montana%20in%201972

priority on protecting human health and quality of living for a future that is not limited by a changing political landscape.

We acknowledge and appreciate the progress that has been put forth by this committee to create a healthy environment in the state of Maryland, and we urge you to continue including health in all policies by passing this legislation for our futures and our children's futures.

Cost Analysis

We estimate that the current health cost to Maryland without an environmental human rights amendment is over $6 billion associated with physical harm due to air quality and children's mental health. These costs are likely underestimated.

We chose to calculate air quality and children's mental health concerns because we felt that these are some of the most pressing environmental issues in Maryland. The city of Baltimore and Maryland have a wide range of air quality variability throughout the city and state. Communities living near and around the Baltimore Incinerator, an unmistakable Baltimore landmark, will have different air quality exposures than communities such as those living in Frostburg, Maryland. Air quality is an environmental attribute that impacts everyone.

Many of us are reluctant to be excited about a future with uncertainty in which extreme weather occurrences are expected to intensify and adverse health outcomes are to increase. This opinion is shared by many people our age globally, who feel unsure of what future challenges will be, due to governmental inaction to reduce and mitigate the environmental impacts.[2] For this reason, children's mental health was our second subject for analysis.

Methods

We come to present our findings after spending months assessing the literature, consulting subject matter experts, and quantifying an expected economic impact.

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[2] Marks, Elizabeth and Hickman, Caroline and Pihkala, Panu and Clayton, Susan and Lewandowski, Eric R. and Mayall, Elouise E. and Wray, Britt and Mellor, Catriona and van Susteren, Lise, Young People's Voices on Climate Anxiety, Government Betrayal and Moral Injury: A Global Phenomenon. Available at SSRN: https://ssrn.com/abstract=3918955 or http://dx.doi.org/10.2139/ssrn.3918955).

In reviewing available studies, research, and literature, we found that there exist limited resources on this subject. However, from the limited studies available, we identified different frameworks for assessing the population attributable factor. A population attributable factor is the impact that a certain risk or exposure has on a population. After consulting with subject matter experts and economists, we were surprised to find that population attributable factors for air quality and children's mental health caused by poor environmental exposures are not readily available. We modified our approach to reflect a population attributable factor (PAF) associated with conservative (25% PAF), moderate (50% PAF), and extreme (75% PAF) cost predictions.

In addition to these calculations we also:

- Consulted Literature – National and State databases (Appendix A)
- Consulted Subject Matter Experts and Economists
- Developed Frameworks and Assumptions (Figure 1 and Figure 2)
- Acknowledged Uncertainties (Appendix B)

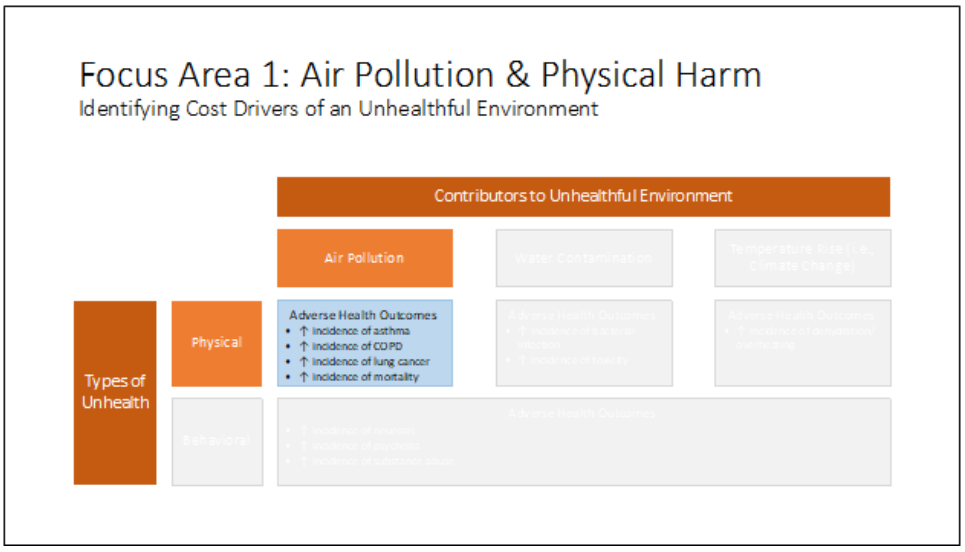
The framework as referred to in Figure 1 was created to quantify the costs of air pollution and its association with physical illness. It shows the connection between the environment and adverse health outcomes. Using this framework, we gathered healthcare costs attributed to adverse health outcomes including asthma, chronic obstructive pulmonary disease (COPD), and lung cancer to use as cost references. The sums of these costs were totaled and then applied with different population attributable factor scenarios (Table 1). This allowed us to directly associate the cost of inaction of poor air quality and healthcare costs.

Table 1. Total Annual Cost of Physical Health Expenses Attributable to Inaction

	Conservative (25% PAF)	Moderate (50% PAF)	Extreme (75% PAF)
Asthma	$4.5 B*	$9 B	$13.5 B
COPD	$269 M*	$538 M	$807 M
Lung Cancer	$1.1 B	$2.2 B	$3.3 B
Total	**$5.87 B**	**$11.74 B**	**$17.61 B**

* M - Million **B – Billion

Figure 1.



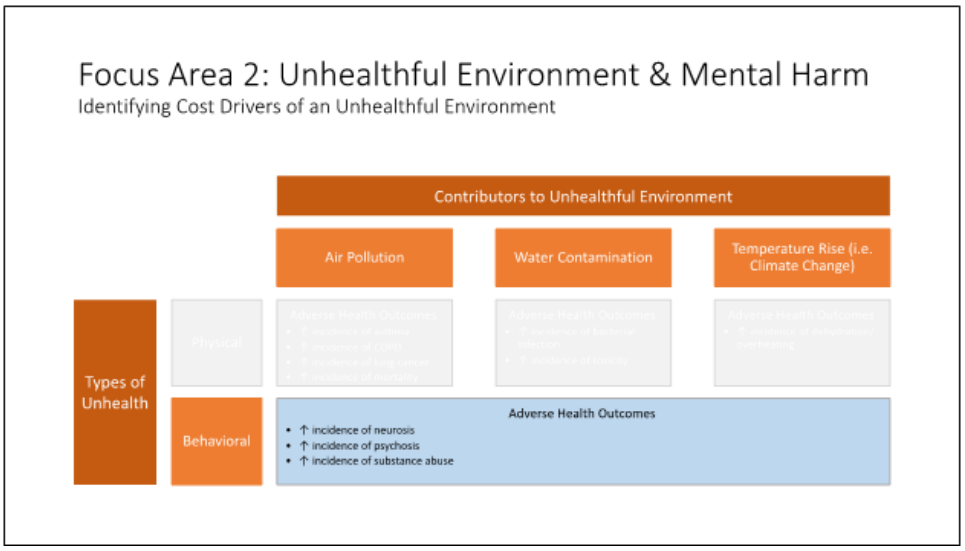
The framework referred to in Figure 2 was created to quantify the costs of mental health issues in children under the age of 18, attributed to environmental unhealth. Using this framework, we estimated the environmental causes of childhood and adolescent mental health (such as psychosis and anxiety), mood disorders, substance abuse, and developmental disorders. We then calculated the healthcare costs associated with each of these disorders and applied three different population attributable factor scenarios.

Table 1: Annual Economic Burden of Environmentally Mental Health Illness in Maryland Children Adjusted for Inflation

	Conservative (25% PAF)	Moderate (50% PAF)	Extreme (75% PAF)
Psychotic Disorders	$2 M*	$4 M	$6 M
Anxiety Disorders	$695 M	$1.390 B	$2.085 B
Mood Disorders	$513.5 M	$1.027 B	$1.540 B
Substance Abuse	$96.2 M	$192.5 M	$802 M
Developmental Disorders	$261 M	$431 M	$4.722 B
Total	$1.568 B**	$3.044 B	$4.723 B

* M - Million **B – Billion

Figure 2.



Indirect and Direct Costs:

Our data shows that healthcare costs associated with an unhealthy environment can be significant. The costs provided are associated with healthcare costs but do not necessarily delineate indirect costs associated with adverse health outcomes attributable to an unhealthful environment. (Indirect costs related to an unhealthy environment can include lost productivity, absenteeism, and lost years of life.) This signifies that our calculation likely underestimates the total burden of costs on communities, small business owners, and healthcare professionals.

Implications

While there is certainly room for improvement in the data when trying to quantify the cost of an unhealthy environment, our research on the available data shows that there can be large economic implications for not providing a healthy environment. It is our recommendation that the State of Maryland adopt an environmental human rights amendment to provide its citizens assurance about the quality of their future and the environment that they live in. This amendment works to mitigate future environmental risks creating better standards of living. We acknowledge and commend the strong work that the current chair has done to improve quality of life in the State of Maryland by improving environmental impacts. We believe that this amendment is the next step towards ensuring a future that supports Maryland's approach to healthy citizens by incorporating health in all policies.

In conclusion, we feel that this amendment is important for multiple reasons. The data that we have presented demonstrates the economic impact of inaction. While there is surely a financial cost associated with this amendment, the cost of inaction is greater than the cost of potential future ligation.

We bring this information to this committee in hopes that it will motivate action to put this bill into law, the people's right to a healthy environment, and thus their right to live healthy lives. The passing of this bill could be the difference between a future in which our children endure environmental harm due to the decisions of today or a future that gives way to the next generation's prosperity. We bring this call to action because we realize how quickly times are changing and with them how our environment and health change.

Appendix:

A. Publicly available data

1. Maryland Statutory Reports
    a. SB340/HB1225 Health in All Policies Workgroup 2019 Report[3]
    b. Maryland Department of Mental Health and Hygiene, Maryland Department of Environmental Health: Maryland's Children and The Environment
2. National Surveys and Databases
    a. Agency for Healthcare Research and Quality: COPD Hospitalizations[4] [5]
    b. Centers for Disease Control and Prevention: National Environmental Public Health Tracking Network Query Tool[6]
    c. U.S. Department of Health and Human Services: National Survey on Drug Use and Health: Model Based Prevalence Estimates 2018- 2019[7]

[3] https://msa.maryland.gov/megafile/msa/speccol/sc5300/sc5339/000113/024600/024610/20200396e.pdf

[4] COPD Burden. (n.d.). Retrieved from https://www.lung.org/research/trends-in-lung-disease/copd-trends-brief/copd-burden

[5] Wier, L.M. (Thomson Reuters), Elixhauser, A. (AHRQ), Pfuntner, A. (Thomson Reuters), Au, D.H. (Department of Veterans Affairs). Overview of Hospitalizations among Patients with COPD, 2008. HCUP Statistical Brief #106. February 2011. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb106.pdf

[6] Centers for Disease Control and Prevention. (n.d.). *National Environmental Public Health Tracking Network Query Tool*. Centers for Disease Control and Prevention. from https://ephtracking.cdc.gov/DataExplorer/.

[7] U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (2019). National Survey on Drug Use and Health 2018-2019 (NSDUH-2018-2019-DS0001). Retrieved from https://datafiles.samhsa.gov/

    d. U.S. Environmental Protection Agency: Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts [8]

3. Census data
    a. Maryland County Populations[9]
    b. Population of Maryland[10]
    c. U.S. Population[11]

B. Uncertainties

- Reported costs do not attempt to estimate costs associated with:
    - physical harm attributable to water contamination,
    - physical harm attributable to increased greenhouse gas emissions,
    - children experiencing multiple health disorders, or
    - adult mental health and substance disorders attributable to environmental factors.
- Reported costs do not attempt to estimate costs associated with fines, lawsuits, or externalities to Maryland residents (e.g., out-of-pocket medical expenses, cost of pain and suffering, missed wages from work, etc.).

Due to limitations in research focus, estimates of population attributable fractions (PAFs) for mental health and substance abuse disorders and environmental exposures are not available. Assumptions for PAFs are based on statistics from published survey results and qualitative research.

[8] EPA. 2021. Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. U.S. Environmental Protection Agency, EPA 430-R-21-003. From: https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf

[9] Population of counties in Maryland (2021). (n.d.). Retrieved December 13, 2021, from https://worldpopulationreview.com/us-counties/states/md.

[10] *Census profile: Maryland*. Census Reporter. (n.d.). Retrieved December 13, 2021, from https://censusreporter.org/profiles/04000US24-maryland/.

[11] *U.S. and World Population Clock*. United States Census Bureau. (n.d.). Retrieved December 8, 2021, from https://www.census.gov/popclock/.