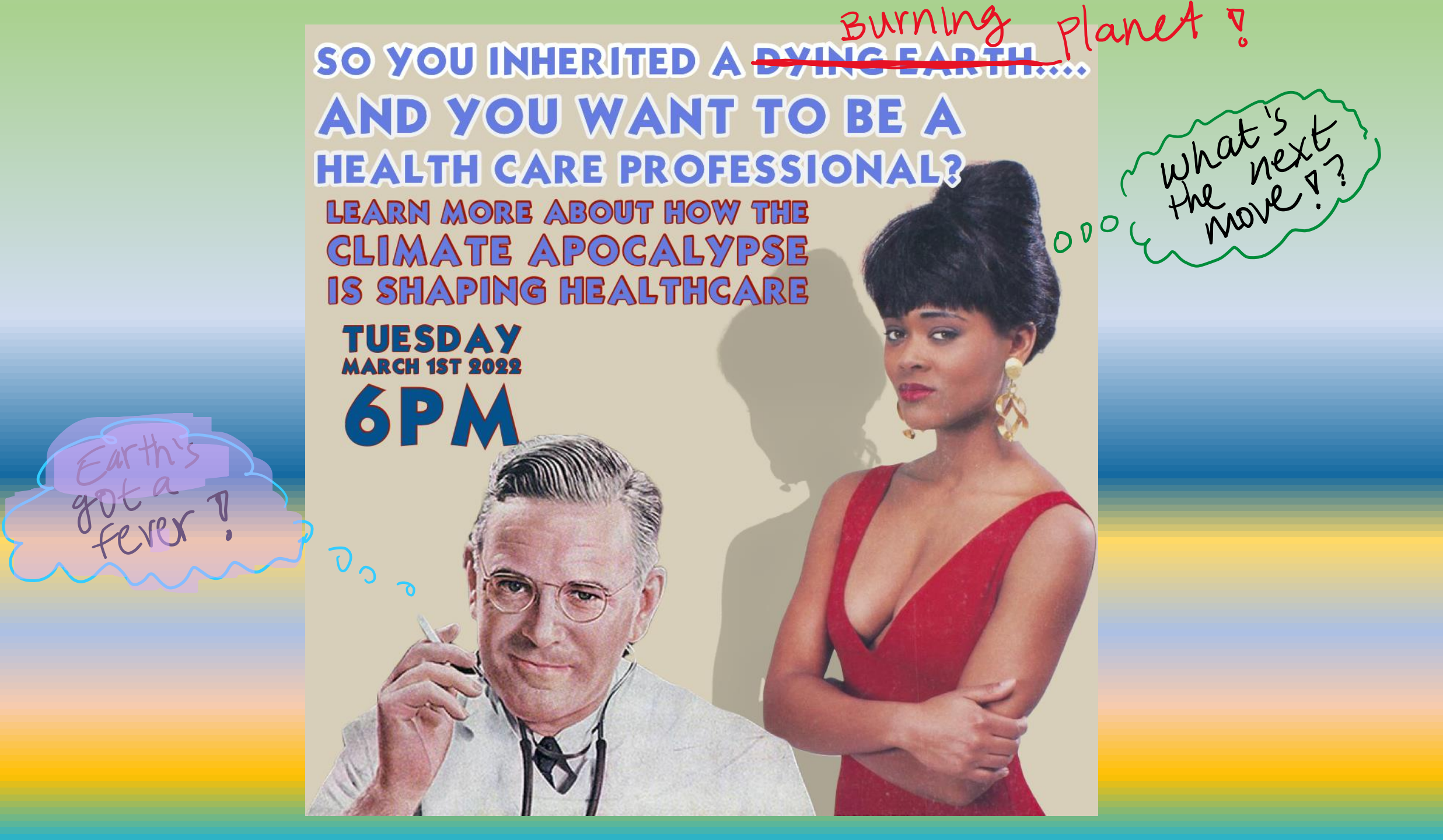

SO YOU INHERITED A ~~DYING EARTH~~ Burning Planet!...
AND YOU WANT TO BE A
HEALTH CARE PROFESSIONAL?
LEARN MORE ABOUT HOW THE
CLIMATE APOCALYPSE
IS SHAPING HEALTHCARE
TUESDAY
MARCH 1ST 2022
6PM
Earth's got a fever!
what's the next move!?

HAPPY MARCH!

CHECK IN QUESTION

NAME/PRONOUNS

Does March have a feel? If so what is it?

What is your favorite genre of Book/Movie/TV

and what do you think that says about you?

BUT FIRST

A WORD FROM OUR SPONSORS

FARM 2 POWER

CLIMATE CHANGE / MASS EXTINCTION IS FORCING US TO RE-EVALUATE OUR RELATIONSHIP WITH THE EARTH

Now more than ever, healthcare professionals are having to consider rising health concerns that are strongly correlated to climate change.

As healthcare professionals, we must ask ourselves--how do we approach healing when everything around us is hurting?

-Low income areas!!
-Global South
-Rural areas!!
-People of color/Disabled people/marginalized people of all isms !!

HOW ARE MEDICAL TEAMS ADAPTING?

CLIMATE CHANGE IS NON--LINEAR AND OUR INFRASTRUCTURE IS NOT THAT GIRL!!!!!!!!

There's a harmful misconception that the climate change will progress linearly and that everything will get worse over time…..this is not true!!

Warming trends

Nonlinear climate change

Christian L. E. Franzke

Nature Climate Change **4**, 423–424 (2014) | Cite this article

3018 Accesses | **46** Citations | **43** Altmetric | Metrics

Most studies assume that temperature trends are linear. Now, research demonstrates that warming trends are nonlinear, that warming accelerated over most of the twentieth century and is much stronger since 1980 than calculated by linear methods.

Mass extinction is here! Our earth is rapidly changing primarily in response to toxic human behavior. Extreme weather patterns and 'natural' disasters will increase in frequency and severity in an unpredictable manner.

- agriculture
- war machine
- fashion
- oil/fracking/non renewable energy sources

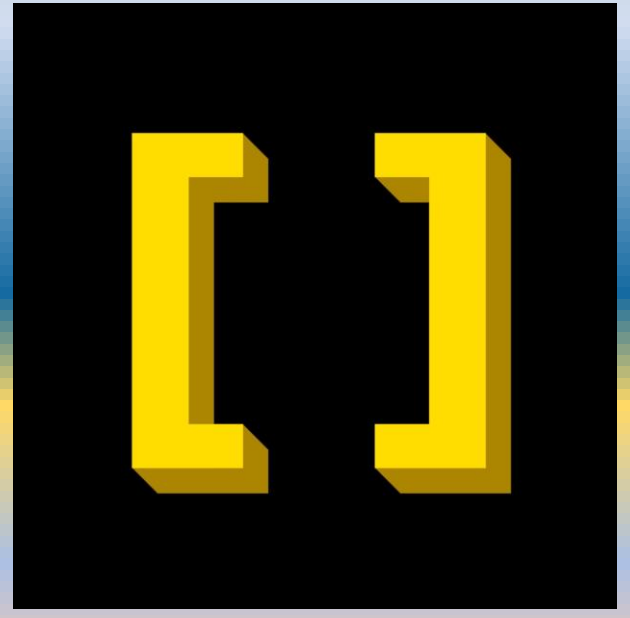
WE DO NOT HAVE THE INFRASTRUCTURE TO DEAL WITH THE EVER-CHANGING CONDITIONS.

i.e there's no legislature that's even being taken seriously to prepare for mass migration and the influx of environmental refugees. There's no currently plans to change our dependency on private vehicles….the shift to electric is not giving….

Not Re-evaluating our approach to medicine is rooted in climate denialism

Nima: These solutions are almost always incremental and market-based, and these same Democrats refuse to embrace what's actually needed: keep fossil fuels in the ground, and mobilize public resources so that we can make the broad social changes we need to address the climate crisis. The most powerful Democrats, people like Nancy Pelosi, have not only steered clear of more far-reaching policies, but have actively undermined them, as seen most clearly with her opposition to the Green New Deal — often under the guise of debt scolding.

- Medicine sits at an intersection of violence and its material consequences are devastating for oppressed groups.
  - Also a lot of our medical knowledge production 'procedures/operations' that is seen as 'legitimate'…that seem orderly….primarily centers market values rather than protecting humans and non human animals.



Keeping in mind which communities are vulnerable….no wonder there isn't robust movements to change healthcare infrastructure….there's no market gain!

THE “WORLD” IS ~ENDING~…..WHAT IS OUR PLAN?

Climate denialism is at the root of systematic inaction. There is not a ‘fear of god’ element to our procedures and actions…those in charge of how our infrastructure operates are moving at a pace that’s natural to them because they don’t have stakes in our survival.

Lets Listen a bit to ep. 121 of Citations needed.

of objection she has. The issue isn’t actually the Republican Party here. The issue is the fact that Democratic leadership is about box checking rhetoric, for the most part, and for the three reasons we listed doesn’t really have any urgency around this problem. Now, if anyone’s ever known anyone who’s an End-Times Evangelical Christian all they talk about is Jesus and why you need to convert to Jesus and, you know, I had a relative like that and then sometimes my other relatives would say, ‘Well, why is it all they ever talk about? All they talk about is Jesus,’ and I’m like, look, if you thought the world was about to end, and if you didn’t save my soul, I was going to eternal damnation, you better fucking A only talk about Jesus. Like, it’s the logical —

Nima: It’s the thing that’s going on.

Nima: It’s the thing that’s going on.

Adam: Yeah, like, and now, whereas that’s fiction, climate change is real and the urgency with which scientists speak about it, in these kind of apocalyptic terms, I think correctly, with very finite deadlines of saying, ‘Look, if we don’t do it by X date, this just isn’t going to happen, we’re not going to be able to reverse this,’ and acknowledging that and sort of, again, name checking and box checking that but then you turn around, and you sort of go, ‘Yeah, whatever, we can get around to this.’ There’s a huge gap there that your brain perceives and I do think sows cynicism and, again, it’s itself a form of climate denialism. So that’s kind of what we’re going to get at today. There isn’t the fear of Jesus, in how we talk about the science that they allegedly acknowledge exists.

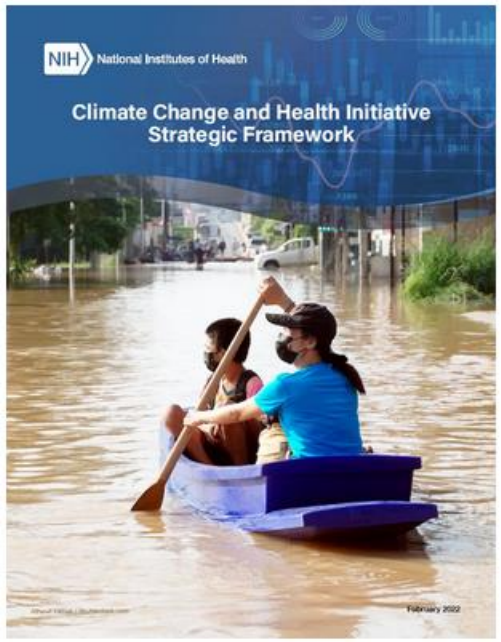
First, it's important to lay out the stakes of what we're talking about here. Democrats say they believe in science, right? So what does the science actually say? Researchers found in January 2019, that humanity has a 64 percent chance of keeping the temperature rise below the international target of 1.5 degrees Celsius but only if the phase out of fossil fuel infrastructure begins immediately, which means every car, every plane, every power plant in existence gets replaced by a zero-carbon alternative at the end of its lifespan. Now, a study published in tar sands. In other words, the only way to curb the climate crisis is to dramatically curb fossil fuel extraction, which would require an economy and society-wide mobilization that includes massive amounts of public spending so that we can take care of everyone — workers, frontline communities — to make sure no one is hurt by this shift. In October 2018, the UN Intergovernmental Panel on Climate Change, the IPCC, said we have only 12 years to keep global warming to a maximum of 1.5 degrees Celsius and prevent the worst of what floods, droughts, storms and resulting human deaths would inevitably occur if we didn't. According to a summary of that report, limiting global warming to 1.5 degrees Celsius would require quote, "rapid and far-reaching" end quote, transitions in land, energy, industry, buildings, transport and cities. Failure to achieve this would be catastrophic. It would mean, again, floods, super storms, poverty, droughts, and mass food insecurity that affects hundreds of millions of people around the globe, threatening the very foundation of human civilization itself.

Adam: In sum, if you quote-unquote "believe the science," you have to believe — at a minimum — that fossil fuels have to stay in the ground and stay in the ground now. A massive industry halted in its tracks and society transforms to account for this. In other words, your solutions must necessarily be large scale and radical by definition, you have to believe that if you quote-unquote "believe the science," that is literally what the science has been saying for years. A recent

SO WHAT EXACTLY ARE WE DOING?

Well there is research on it….

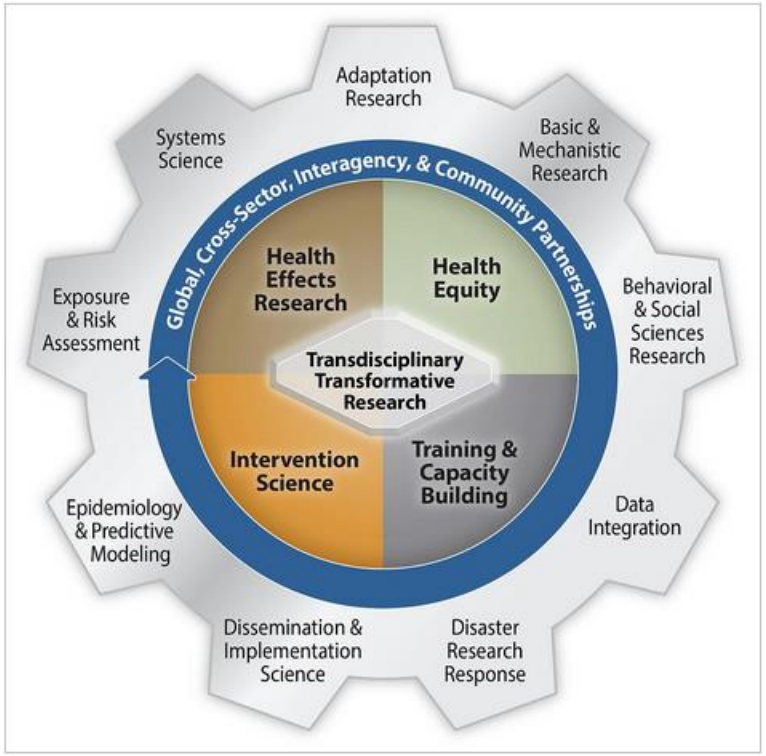
Strategic Framework



The NIH Climate Change and Health Initiative Strategic Framework includes input from the scientific and stakeholder communities. The Framework provides the initial planning of how the NIH community will address climate change and health.

View the Strategic Framework pdf

Strategic Framework Fact Sheet pdf



Partnerships. NIH is a trusted and sought-after partner in research and translation, both at home and around the world. For more than a decade, there has been a call to bridge gaps across federal agencies in efforts on climate change and health research, funding mechanisms, program development, implementation, and research translation to provide comprehensive, whole-of-government solutions. Through a strategic focus on climate change and health, NIH will better integrate its own research activities and enhance the success of other federal efforts by providing critical public health and biomedical data and expertise to bridge these gaps. Partnerships, not only with traditional public health-oriented agencies like the CDC and EPA, but especially with geoscience-focused agencies such as The National Aeronautics and Space Administration (NASA), The National Oceanic and Atmospheric Administration (NOAA), The National Science Foundation (NSF), U.S. Geological Survey (USGS), and global partners, have high potential for new solutions to address these complex challenges. Studies that leverage information from non-health sectors, including agriculture, energy, and transportation, will be critical to understanding health outcomes and adaptation co-benefits. Current NIH partnerships in federal climate activities include the National Climate Assessment, the National Strategy for the Prevention of Vector-Borne Disease in Humans, the National Integrated Heat Health Information System, and many others. Other recommended partnerships include private-public collaborations, including major philanthropies, transdisciplinary academic centers, and with historically Black colleges and universities (HBCUs) and minority-serving institutions, community organizations, and local, state, and international government agencies.

Together these key NIH capacities present a strong basis for a strategic focus in this area. However, the most compelling argument for coordinated and expanded NIH leadership on climate change and health is articulated in the NIH mission, which is:

"To seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability."

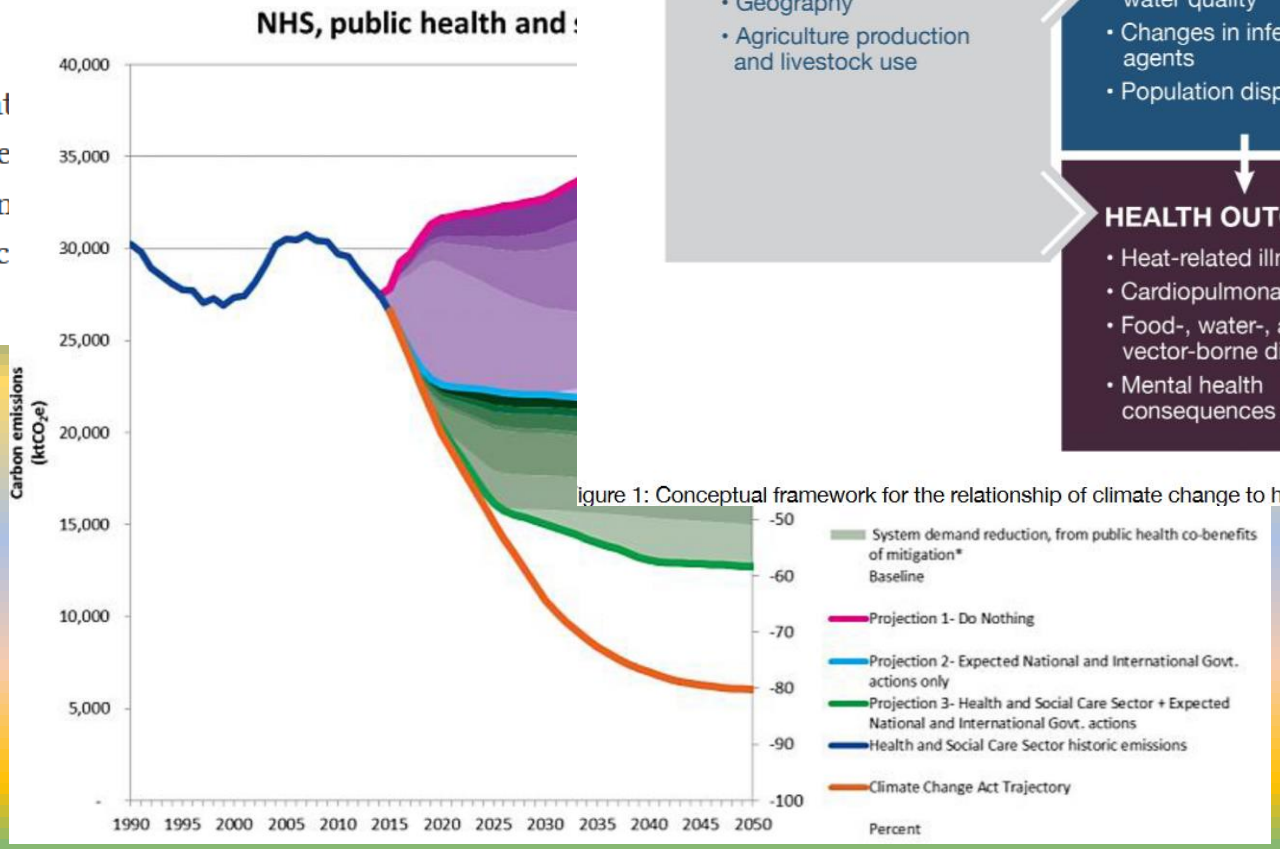
There is perhaps no greater opportunity for NIH to fulfill its mission than by providing global leadership in the response to the burgeoning climate change and health crisis.

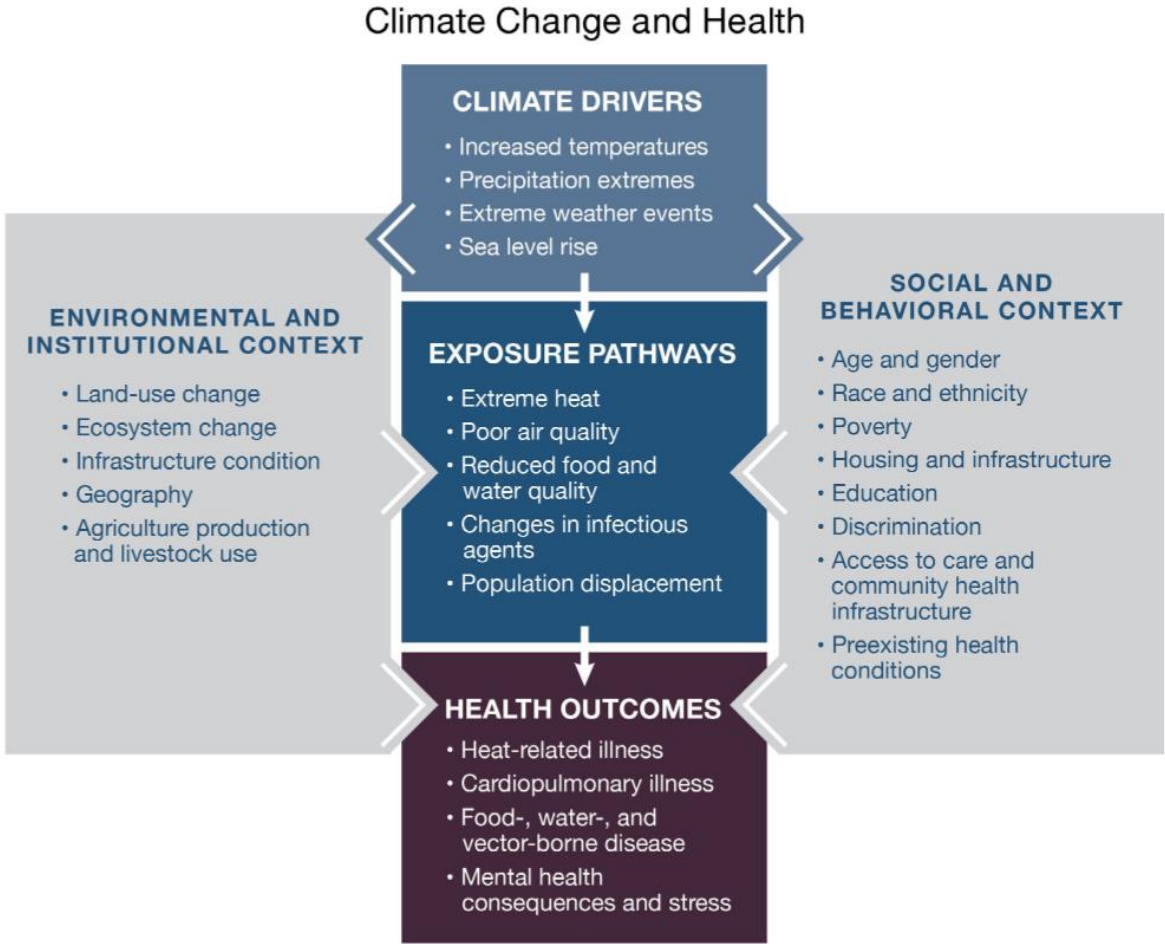
Results

During the six-year baseline period, the overall temperature-attributable hos admissions, LoS, and associated costs were estimated to be 3915 cases (95% empirical confidence interval (eCI): 235, 7295), 99,766 days (95% eCI: 14,484, 168,457), and AU$159 million (95% eCI: 18.8, 269.0), respectively. A climate sc consistent with RCP8.5 emissions, and including projected demographic cha estimated to lead to increases in heat-attributable hospital admissions, LoS, a costs of 2.2% (95% eCI: 0.5, 3.9), 8.4% (95% eCI: 1.1, 14.3), and 7.7% (95% eCI: 13.3), respectively by mid-century.

Conclusions

There is already a substantial temperat admissions, LoS, and costs which are e and an increasing aged population. Un interventions are put into action, the c admissions will be high.





igure 1: Conceptual framework for the relationship of climate change to human health (reprinted from U.S. NCA, 2018).[4]

To meet the challenge laid before NIH, an executive committee comprising the directors of seven Institutes and Centers – National Institute of Environmental Health Sciences (NIEHS), Fogarty International Center (FIC), National Institute on Minority Health and Health Disparities (NIMHD), National Institute of Mental Health (NIMH), National Institute of Nursing Research (NINR), Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), National Heart, Lung, and Blood Institute (NHLBI)—has committed to providing leadership and oversight of the NIH Climate Change and Health Initiative. The NIEHS director chairs the executive committee, and NIEHS provides the Initiative's administrative home. Staff of 23 NIH Institute, Centers, and Offices (ICOs) currently engage in the NIH Climate Change and Health Working Group, co-chaired by NIEHS and FIC. The purpose of the group is to support the Initiative in the design and implementation of a coordinated approach to research, training, and capacity building to respond to the urgent and ubiquitous threats posed by climate change to health globally.

OUR APPRAOCH TO CLIMATE CHANGE IN HEALTHCARE IS STEEPED IN DENIALISM

So as you can see….on a policy level, there's not a lot of work being done for us to have a solid foundation that supports vulnerable communities…..that means that a lot of the solution oriented conversations that need to take place are gonna look like this.

It's gonna look like bottom up information sharing. The higher ups aren't acting robustly to save as many lives as possible….so pertinent conversation is happening in grassroots organizations like farm2power….orgs like my social justice org in my post bacc program.

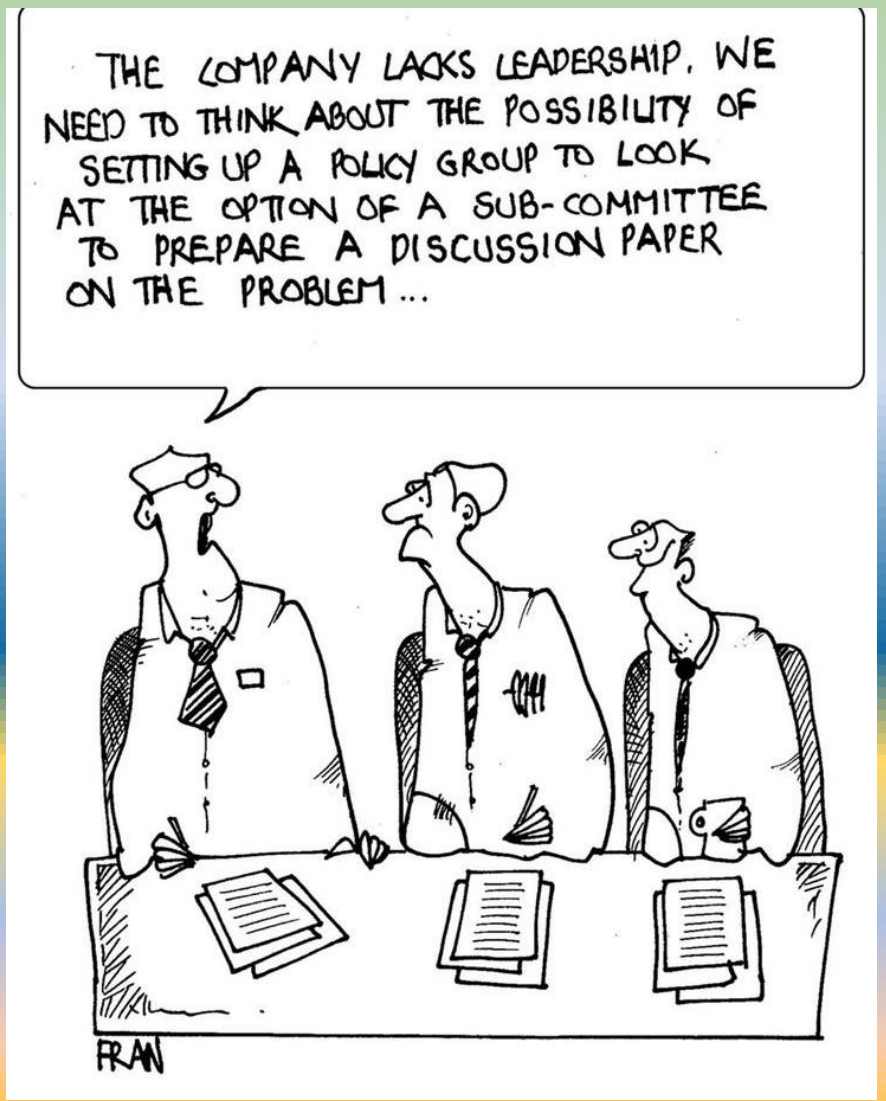
The solutions might look home made…might not look shiny and high tech and sexy….the conversations we have and the solutions we come up with must be creative, expansive, and ALTERNATIVE. It would be nonsensical for these solutions we come up with to include institutions that have already failed us….

Denialism cont…

- We have to redefine what ‘progress’ looks like…..especially when that progressiveness is SLOW! heavily reliant on unsustainable infrastructure. We don’t need insurance companies….we don’t need more legal paperwork….we don’t need any more committees….we need tangible change.

- Unless there’s action from the ‘higher ups’ that are actually expansive enough/are to scale with the issue….we have to do smaller tasks that address aspects of the issue and we have to address it in a way that has reach to vulnerable communities….we can’t wait for more ‘formalized’ procedures that address these issues.

- Now lets look at which problems we’re gonna see on the rise



HOW ARE HEALTHCARE PROFESSIONALS IMPACTED DIRECTLY?

1.ELECTRICITY

Power outages, due to extreme weather, are happening more frequently and are lasting longer. This means vital facilities that have poor infrastructure/are not well funded are very vulnerable during these times.

When patients require oxygen, they don't have the luxury of time, she said: "They have to go the ED [emergency department] or otherwise they die, right? The people die."

In Texas, a blast of Arctic air, paired with chronic failures to weatherize the power grid, led to outages that rolled on for days. Slightly more than two-thirds of Texans lost power at some point from Feb. 14 to 20 — outages that averaged a total of 42 hours, according to a University of Houston survey conducted online with 1,500 residents.

Once the power is out, and medical devices are failing, the next stop is often a nearby hospital.

> "There are a lot more people living at home with medical assistive devices that are being maintained because of these devices," Riviello said. "And I don't know that they always think of the 'What if' situations.'"

Across Texas, other families were facing similar dilemmas. The ambulance provider MedStar, which serves the greater Fort Worth area, fielded more than 50 calls — including Dorothy's — from Feb. 15 to Feb. 17 involving patients with life-sustaining medical devices and no power. A San Antonio emergency room doctor, Ralph Riviello, told Undark that around 18 to 24 people showed up at his hospital during the crisis, desperate to recharge medical equipment. Near Houston, a 75-year-old man froze to death in his truck; his family believes he ventured out to get a spare oxygen tank from the vehicle after losing electricity at his home.

These are not just one-off tragedies. Some experts warn that complex home-based medical care is on a collision course with climate change, as severe weather events become more frequent nationwide.

Hospitals typically have redundant power sources but due to other confounding variables such as:

- age of building
- funding
- location and proximity to other hospitals

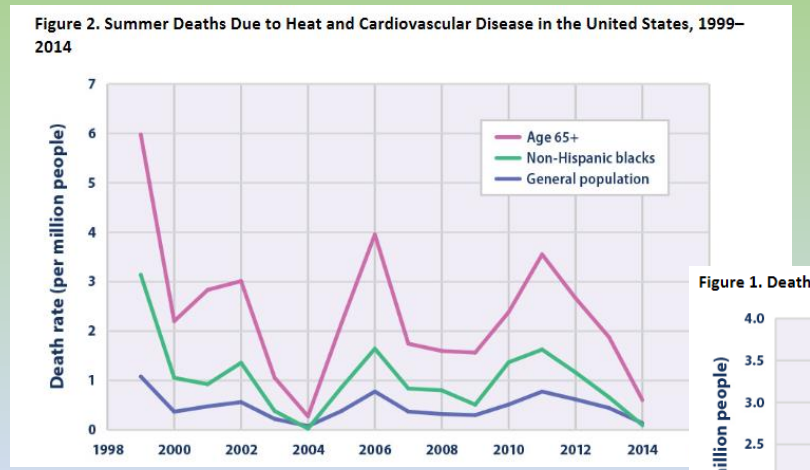
Sometimes the back up generators can fail or only supply a fraction of the energy required. Regardless of the circumstances, when back-up power is lost, there are still ways to carry on!!

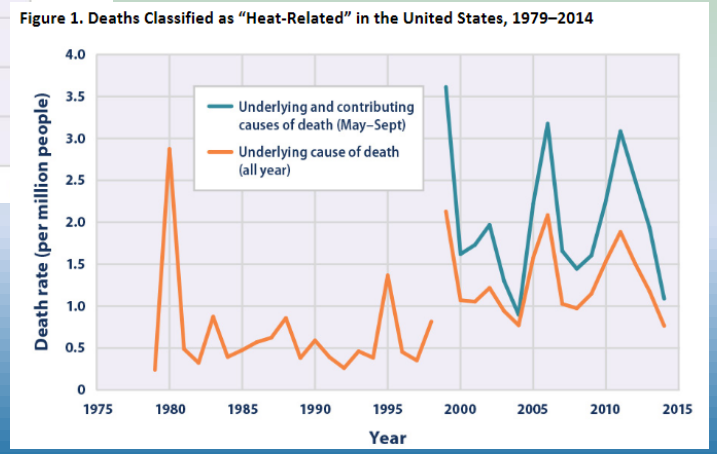
The list goes on and on but the point is, healthcare professionals must be more adaptable than ever to changing conditions. Being responsive and efficient during times of stress is a good skill to practice

- Intensive care unit is prioritized by having extra medical teams available
- Operating rooms are powered by flashlight
- ER department directs people to other hospitals that have not lost power
- Pharmacy techs prioritize preserving medication inventory by icing medications that need to be kept in freezers, they can also move medications to alternate locations.
- Radiologists have to learn to use basic, portable x ray machines that are battery operated
- Etc….

https://hospitalmedicaldirector.com/hospital-power-outages/

OOOoooohhhh the HEAT chile





- More heat can elongate allergy season which can intensify respiratory diseases.
- Senior citizens, poor children, and others are vulnerable to heat related illnesses
- Trauma from heat waves or wildfires can exacerbate mental heath issues like anxiety, depression, and suicide.
- Hotter days, more rain, and higher humidity produces more ticks that can spread infections diseases
  - more rain due to hotter days can also worsen respiratory disease due to indoor air pollutants, fungi, and increasing mold.

The kinds of diseases/illnesses/infections we have to keep in mind when diagnosing must be more creative than ever. We have to really consider EVERYTHING

https://www.nationalgeographic.com/climate-change/how-to-live-with-it/health.html
https://www.epa.gov/sites/default/files/2016-08/documents/print_heat-deaths-2016.pdf

Unusually hot summer temperatures have become more common across the contiguous 48 states in recent decades[1] (see the High and Low Temperatures indicator), and extreme heat events (heat waves) are expected to become longer, more frequent, and more intense in the future.[2] As a result, the risk of heat-related deaths and illness is also expected to increase.[3] Reductions in cold-related deaths are projected to be smaller than increases in heat-related deaths in most regions.[4] Death rates can also change, however, as people acclimate to higher temperatures and as communities strengthen their heat response plans and take other steps to continue to adapt.

Certain population groups already face higher risks of heat-related death, and increases in summertime temperature variability will increase that risk.[5,6] The population of adults aged 65 and older, which is expected to continue to grow, has a higher-than-average risk of heat-related death. Children are particularly vulnerable to heat-related illness and death, as their bodies are less able to adapt to heat than adults, and they must rely on others to help keep them safe.[7] People with certain diseases, such as cardiovascular and respiratory illnesses, are especially vulnerable to excessive heat exposure, as are the economically disadvantaged. Data also suggest a higher risk among non-Hispanic blacks.[8]

We have to be more creative with solutions to climate change related health issues…

Urban areas are typically warmer than their rural surroundings. Large metropolitan areas such as St. Louis, Philadelphia, Chicago, and Cincinnati have seen notable increases in death rates during heat waves.[2] Climate change is projected to increase the vulnerability of urban populations to heat-related health impacts in the future. Heat waves are also often accompanied by periods of stagnant air, leading to increases in air pollution and associated health effects.[2]

- Crop decline could lead to malnutrition. More CO2 in the air due to failing crops could also impact the foods we do have.
- Air quality could impact cardiovascular and respiratory health
- Ground-level ozone can damage lung tissue, reduce lung function, and inflame airways. This can aggravate asthma or other lung diseases. Children, older adults, outdoor workers, and those with asthma and other chronic lung diseases are particularly at risk

BACK TO MENTAL HEALTH……

Healthcare professionals must also be prepared to deal with the rise of SOLASTALGIA!

- an emerging form of depression (comparable to climate anxiety) that is expected to rise as more extreme weather patterns become the norm.

People are feeling hopeless and powerless and that is impacting their overall health.

Note that the severity that SOLASTALGIA impacts people relative to their access to resources and their connection to the land

Solastalgia (/ ˌsɒləˈstældʒə/) is a neologism that describes a form of emotional or existential distress caused by environmental change. It is best described as the lived experience of negatively perceived environmental change. A distinction can be made between solastalgia linked to mourning what is already lost (Ecological grief), and eco-anxiety linked to what may happen (associated with "pre-traumatic stress", in reference to post-traumatic stress).

community.[6] Societies whose livelihoods are not closely tied to their environment are not as likely to express solastalgia and, in turn, societies that are closely tied to their environments are more susceptible.[7] Groups that depend heavily upon agroecosystems are considered particularly vulnerable.[7] There are many examples of this across Africa, where agrarian communities have lost vital resources due to environmental changes.[7] This has resulted in an increase in the number of environmental refugees throughout Africa in recent years.[7] Solastalgia tends to affect wealthier populations less.[8] A study conducted in the western United States showed that higher-income families experienced the effects of solastalgia significantly less than their lower-income neighbors following a destructive wildfire.[8] This is due to the flexibility wealth can provide.[8] In this case,

LET’S GET A BIT MORE SPECIFIC

Lets talk….LUNGS

Lung Related Issues—Mass Inhaler prescriptions?

For example, as our air quality continues to deteriorate, what tangible solutions can we offer vulnerable households?

Should there be inhalers prescribed to every household? What kind of inhalers? Are we approaching distribution in a way that's accessible/effective/and climate conscious?

INTRODUCTION

mate change has been described as the "greatest threat to global public health in th
ntury".[1, 2] On 1 May 2019, the United Kingdom was the first country in the world to
climate emergency"[3] in response to the Intergovernmental Panel on Climate Chang
port in 2018. The primary method for combating climate change is to reduce greenh
s emissions (GHGEs)[4] and the UK government has committed to achieving net zero
mpared to a 1990 baseline by 2050.[5, 6] In order to achieve this goal, a number of se
l need to reduce their emissions. One of these sectors is the UK National Health Se
HS), which is the UK's largest public sector greenhouse gas emitter.[6-8] Importantly, a
% of the NHS's carbon footprint is derived from a single treatment - pressurized m
se inhalers (pMDIs) [8-11] which are used in the management of asthma and chronic
structive pulmonary disease (COPD). The inhaler constituent responsible for 96% o
MDI's global-warming potential (GWP), is not the active ingredient but rather the
opellant.[3, 12] Dry powder inhalers (DPIs) which rely on a propellant-free mechanism
nificantly reduces the environmental impact of the prescription are the favored cho
umber of European countries[13]—although this is also due to nonenvironmental fa
ch as local manufacturing. A priority of the UK's Sustainable Development Unit (SDU
ategy is to achieve an 80% reduction in NHS's GHGE by 2050 and this involves switc
m propellant to DPI inhalers which have a lower GWP (Figure 1).[6, 14]

Inhaler Prescriptions cont.

A study comparing carbon footprints of the entire life-cycle of various inhalers including their productive and distribution found that MDI devices had up to 30 times larger carbon footprints than DPI equivalents and that these differences were mainly related to the use phase and end-of-life (disposal) phase.[22] It was calculated that if England applied the Swedish distribution of pMDIs and DPIs, 550 kt of CO_2 would be saved annually—which corresponds to approximately 2.6% of NHS England's total carbon footprint.[22]

Furthermore, the inappropriate disposal of pMDIs contributes further to their environmental impact.[23] Although some pMDIs do have dose counter mechanisms, this is not universal (in contrast to DPIs) and means that patients may not know how many doses are left in their inhalers. This creates two problems: firstly, patients can unknowingly run out of doses which is potentially catastrophic during an acute exacerbation of asthma or COPD; and secondly, it leads to patients being more likely to request repeat prescriptions earlier than necessary.[24] The inappropriate disposal of pMDI devices with unused doses is especially concerning as not only does it increase the prescribing burden but devices no longer in use continue to release greenhouse gases into the atmosphere.[23] In a UK study, inhalers that had been disposed of incorrectly were collected over 90 days from one local district hospital and this resulted in enough pMDIs to produce an equivalent of 2.63 tonnes of CO_2 emissions which would otherwise have been released into the atmosphere.[23] The recent British Thoracic society position statement on "The Environment and Lung Health"[25] highlights the importance of advising patients on avoiding disposal of inhalers in landfill sites and of supporting recycling schemes through pharmacies.

Inhaler Prescriptions Cont.

7 CONCLUSIONS AND RECOMMENDATIONS

Climate change is an existential threat to the entire population of this planet and because of this, all societal sectors must adopt changes to reduce GHG emissions. A shift in inhaler devices prescribing practices in favor of DPIs and away from pMDIs, where clinically appropriate, has the potential to significantly reduce healthcare associated GHGEs.[6] Moreover, as well as the well-documented environmental benefits, a switch towards DPI devices should be supported as DPIs are at least as effective, potentially cheaper and are often are preferred by patients.

In accordance with the NHS Long Term Plan to "shift to lower carbon inhalers"[44] our recommendations are that national and local guidelines are updated; guidance should consider the potential benefits of advising DPIs as the device of choice in new diagnoses of asthma and COPD as well as the benefits of switching patients currently using pMDIs to DPIs where clinically appropriate. We recognize the short-term financial impact on the local health economy but also highlight potential long-term cost savings.

Some concerns have been expressed in response to the proposals to reduce pMDI prescribing in the UK.[45] In line with others,[8] we are not advocating for a total switch from pMDIs to DPIs and recognize that some patients will have valid reasons to continue to use a pMDI but instead aim to explore the relative advantages and disadvantages of changing

THESE SOLUTIONS DON'T COVER EVERYTHING….

Discussion time!

- Can we come up with some 'areas' in healthcare that might be overlooked and which solutions for the pertinent issues are not being talked about as openly?
  - Consider how 'money' is a factor….what resources are available? What infrastructure is already in place? Is it adequate? Does it have reach? Does it think of 'everyone'
  - What are some creative solutions we can come up with that minimizes the role of the 'government' or other institutions that we haven't been able to rely on in the past.
  - Remember…think BOTTOM – UP solutions

THINGS TO CONSIDER……

- Protecting pregnant women and older adults from the impacts of extreme temperatures, especially heat in urban settings.
- Determining how best to test and adapt protocols for the delivery of mental health services to communities during hurricanes, wildfires, and other extreme weather events.
- Assessing what kinds of behavior change strategies might provide health co-benefits during climate mitigation.
- Learning how population-based studies and implementation research might influence uptake and scale-up of clean fuels in global energy replacement programs.
- Applying modeling methods originally developed to assess health effects of air pollution to climate-sensitive diseases such as asthma.
- Elucidating the effects of ambient temperature on UV radiation-induced skin cancers, including non-melanomas.
- Modeling the likely effects of climate adaptations in infrastructure on waterborne and vector-borne disease incidence around the world.
- Quantifying co-benefits to cardiovascular health of reducing reliance on fossil fuels.
- Identifying aspects of food production and distribution that can reduce risk of contamination, maintain nutrient levels, and ensure sustainable access.
- Understanding the effects of climate change-induced stress on reproduction and development.
- Understanding how climate change might alter social and economic determinants of mental health and community well-being in the U.S. and in Low- and Middle-Income Countries (LMICs).

EVERYTHING IS TERRIBLE…..WHY GO ON?

- BECUZ I SAID SO!!
- Optimism is radical dude!!! Being a pessimist serves the status quo!
- Disabled people need us, Indigenous people need us, poor people need us, people in the global South people need us to clean up the mess we made!!
- Being a healthcare professional who is aware of climate justice can make all the difference in the way you take care of patients as mass extinction progresses!!!