The Air We Breathe in Bishkek: A Public Health Emergency[1]

Air pollution is a major cause of death and disease globally. The health effects range from increased hospital admissions and emergency room visits, to increased risk of premature death. An estimated 7 million premature deaths globally are linked to air pollution, mainly from heart disease, stroke, chronic obstructive pulmonary disease, lung cancer, and acute respiratory infections (WHO 2018). Kyrgyzstan is also affected by this crisis; in fact, at 111 per 100,000 inhabitants, mortality in Kyrgyzstan is the second highest in the region, almost three times the region's average.[2] In the winter months, air pollution in Bishkek is regularly exceeding WHO guidelines for particulate matter (PM2.5) by a factor of 10 or more. The problems are largely unstudied and the authorities in charge of monitoring environmental parameters lack the necessary equipment and expertise. In a report published 2014, based on data from the national Hydrometeorological Agency for 2006-2011, UNDP points out that "since 1990, no measurements have been made for dust," despite the fact that concentrations of measured pollutants like NOx exceeded the maximum allowable concentration on 287 of 365 days.[3] Data from the National Statistics Committee suggests that cases of lung disease in Bishkek increased from under 150,000 in 2013 to over 220,000 in 2017. This corresponds to a 49% increase and a staggering 21.4% occurrence rate of lung disease in Bishkek, twice the national average.[4]

Results of independent monitoring of PM2.5
Since 2018, the Kyrgyz-Russian Slavic University and the local NGO, MoveGreen, are independently monitoring air pollution in Bishkek.[5] In January 2018, both reported that levels of PM2.5 in Bishkek exceeded the levels in Beijing (known as one of the most polluted cities in the world), at more than 20 times the WHO recommended threshold of 25µg/m^3. In October and November 2018, the PM2.5 levels in Bishkek spiked again to levels multiple times higher than the national norm. Given that there are more than half a million vehicles in Bishkek, the majority of which are old and do not undergo any technical inspections, transport is estimated to account for over 60% of the air pollution in the city. Heating is a major contributor, too. Most households use coal, for lack of cleaner alternatives. Some public establishments (e.g. banyas) and small industries are even reported to burn old tires and other waste materials for heating. The city's waste disposal sites are also major contributors to pollution, as they are constantly burning and producing clouds of toxic fumes that often reach Bishkek.[6]

The Government response so far
Work on safeguarding the environment in Bishkek is guided by a list of 33 priority measures, which was adopted by the Kyrgyz Government in June 2018, formulated by inter-agency working group. Several of the measures focus on air pollution. While parts of the general public and the Government have started to pay more attention to the issue, sadly both the Environmental Protection Agency (SAEPF)[7] and the Mayor of Bishkek have gone on record to deny that Bishkek is facing a public health emergency.[8] At a recent round table discussion, a SAEPF representative stated that only one of the 33 measures has been implemented so far (in July 2018, customs duties on the import of electric and hybrid vehicles were lowered). On 20 November 2018, the Prime Minister published a statement calling for accelerated action on four of the 33 measures: a) increased access to piped gas for residential heating; b) a shift to gas fuel for public transport; c)

[1] This policy brief has been prepared by a team of researchers after a meeting between NGOs, experts and Development Partners in November 2018. It does not necessarily reflect the views of all members of the Development Partners' Coordination Council.

[2] See WHO data for Kyrgyzstan in the annex.

[3] www.kg.undp.org/[...]/kgz-State-of-Environment-Kyrgyzstan-Dec-2014-ENG.pdf

[4] www.stat.kg/media/publicationarchive/69c50a26-74ca-4fe9-8816-26447055f3fb.pdf

[5] So far, data is primarily available to the public in real time via http://movegreen.kg/abakg/#/ ; in line with WHO guidelines, it is important to report an indicative 24-hour and annual average PM2.5 levels to understand how Bishkek compares to other cities e.g. via aqicn.org.

[6] praguecivilsociety.org/aerial-footage-reveals-extent-of-bishkek-waste-site/

[7] http://respub.kg/2018/11/19/vbishkekenechemdyshat-chinovniki-utverzhdayut-zagryaznennost-vozduxa-v-stolice-predelax-normy/

[8] https://www.facebook.com/312Bishkek/videos/462818060912723/

research on the ban of high-rise construction; d) greening of the city. In addition, he called for incentives for the private sector to boost the green economy[9] and instructed the Ministry of Health to assess the health effects of air pollution and establish thresholds.[10]

Options for increasing the effectiveness of the response
While the list of measures prioritised by the Prime Minister addresses key root causes of pollution and can deliver results in the medium to long term, the interventions are unlikely to reduce the level of pollution this winter. Given the extreme severity of the crisis and the clear, devastating impact on public health, we strongly recommend that the Government consider urgent action focussing on effective short-term measures in the following areas:

a) Public Information: Clear, consistent, and timely communication accessible to all of Bishkek's population
While there have been waves of posts on social media and increased coverage by some of the news outlets, it is not easy for citizens to find information on air quality and how to protect themselves in cases when the pollution levels are too high. We recommend that the Government makes available reliable and current data on pollution levels and issues recommendations about appropriate measures every individual can undertake to protect their health (e.g. by wearing masks, limit time spent outside). Particularly important is information to people with pre-existing conditions (lung disease, cardiovascular problems) and populations at risk (pregnant mothers, children). It is also crucial that all citizens understand the risk at which they are placing themselves and their families, and how they can contribute to reducing pollution by adjusting their own behaviour.

b) Transport
Traffic is both the biggest contributor to air pollution and the one most conducive for immediate and effective measures. There are numerous measures that can be implemented at very little cost. We recommend that the Government considers the introduction of specific measures like: authorizing police to stop vehicles that are visibly polluting, expanding the coverage of paid parking, introducing priority lanes for buses and trolleybuses on the main thoroughfares, introducing mandatory emissions tests for diesel vehicles (e.g. marshrutkas), or even introducing temporary limits to the number of cars allowed to drive on particular days (e.g. by only allowing cars with even license plate numbers to drive on even days in the city when pollution is extremely high).[11]

c) Heating
Coal heating is the preferred option for many households in Bishkek that are not connected to the central heating system. While increasing access to the gas network is extremely important, the process of connecting households is slow and is unlikely to reduce pollution in the short-term. We recommend that the Government considers options for reducing pollution from heating like strengthening enforcement of environmental legislation and discouraging the burning of inferior and polluting fuels like plastics, tyres, textiles, and other types of solid wastes.

d) Waste management
Among the issues not sufficiently taken into account in the context of air pollution is waste management. Bishkek urgently needs a comprehensive waste management strategy, combined with a public education campaign.

e) Graded Response
The measures adopted by the Government on 6 June 2018 are worthwhile and commendable, but they are unlikely to save lives in the current heating period 2018-2019. There are examples of effective comprehensive measures that have been implemented in other cities facing similar crises, based on a response graded by level of pollution.[12] We recommend that the Government takes measures according to the level of pollution, particularly based on concentration of PM2.5. This will require real-time monitoring of air quality, responding and communicating quickly and effectively, but will also ensure that the risk exposure is reduced optimally, and inconveniences caused to the public as a result of unpopular measures (e.g. parking fees, temporary vehicle usage limitations) are reduced.

Outlook
We are encouraged to see that both the public and the Government have begun to take the issue of air pollution more seriously. By addressing the root causes, Bishkek can regain its name as one of the greenest cities in Central Asia and ensure good health for all its citizens.

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[9] See e.g. www.greengrowthknowledge.org/country/kyrgyzstan
[10] See e.g. www.who.int/airpollution/en/
[11] Some of these measures are likely going to be unpopular and face criticism, but with adequate communication and presentation of the problems and risks to health, the support of the population can be won.
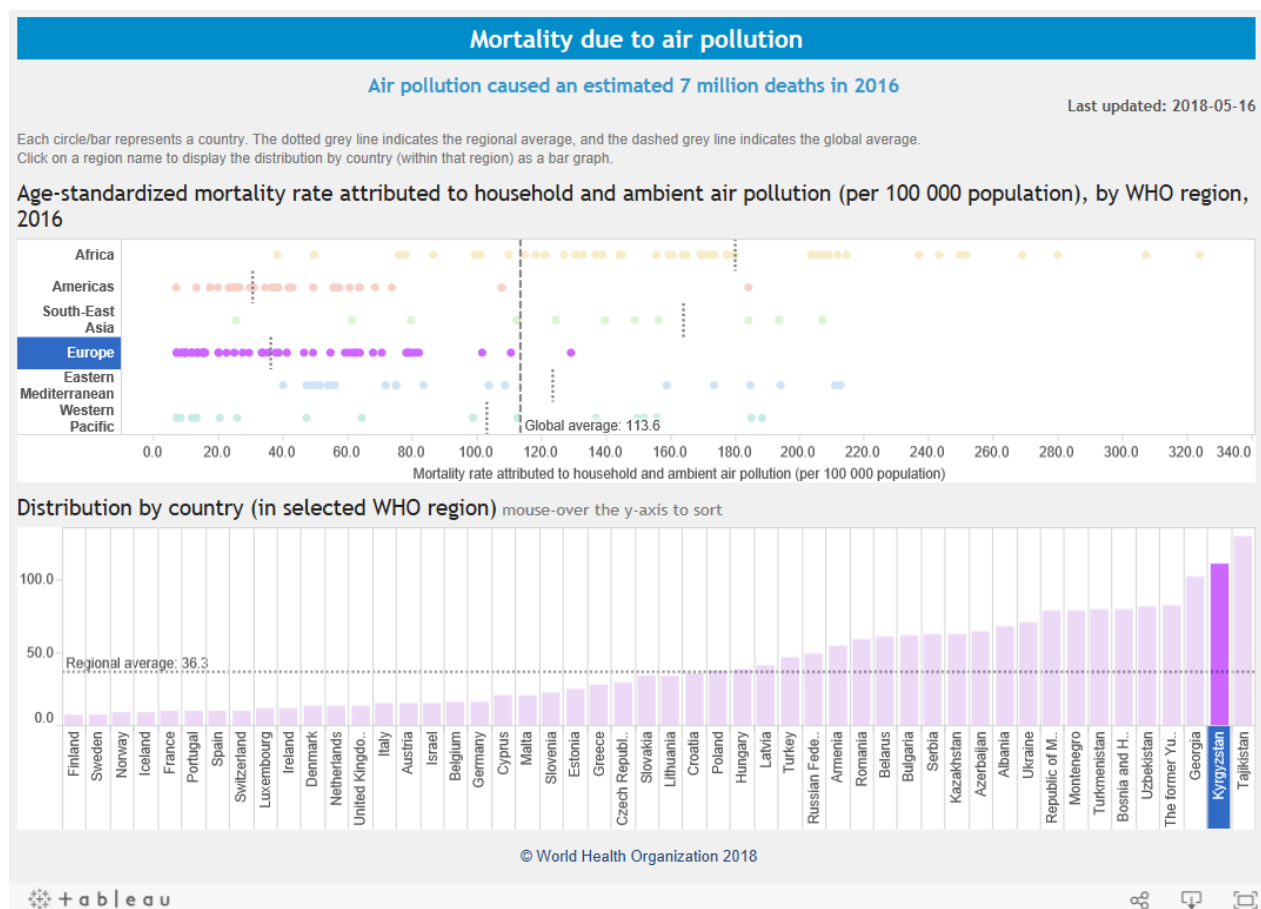[12] See e.g. http://cpcb.nic.in/action-plan/

Deaths attributable to air pollution, 2016, by disease in Kyrgyzstan

	IHD	Stroke	COPD	Lung cancer	ALRI (All age)	**Total**	Deaths per 100,000 capita (crude rate)	Deaths per 100,000 capita (Age-standardized rate)
Ambient	1,817	610	254	61	174	**2,917**	49	74
House	888	361	225	81	179	**1,734**	43	29
Joint	2,563	923	437	132	321	**4,377**	74	111

Source: http://www.who.int/airpollution/data/en/

The age-standardized mortality rate attributed to household and ambient air pollution (per 100 000 population) was 110.7 in Kyrgyzstan in 2016.

Source: http://apps.who.int/gho/data/node.sdg.3-9-viz-1?lang=en