

A conversation with Professor Michael Eddleston, June 19, 2019

Participants

- Professor Michael Eddleston – Director, Centre for Pesticide Suicide Prevention
- James Snowden – Senior Research Analyst, GiveWell

Note: These notes were compiled by GiveWell and give an overview of the major points made by Professor Eddleston.

Summary

GiveWell spoke with Professor Eddleston of the Centre for Pesticide Suicide Prevention (CPSP) for an update on its progress and future plans. In August of 2017, CPSP received a [GiveWell Incubation Grant of \\$1,336,409](#) to begin work aimed at reducing deaths from deliberate ingestion of pesticides. Conversation topics included progress in Nepal and India, CPSP's global campaign, its publications, its organizational structure, and its room for more funding.

A report prepared by Professor Eddleston and sent to GiveWell prior to this conversation can be found [here](#).

Progress in Nepal

Bans on dichlorvos and triazophos

Dichlorvos, which is responsible for significant death in China and has long since been banned in Sri Lanka, is categorized by the World Health Organization (WHO) as a Class Ib highly hazardous pesticide (HHP). As a result of discussions with CPSP in early 2019, Nepal's Pesticide Registrar enacted bans on dichlorvos as well as triazophos (another Class Ib organophosphate).

CPSP hopes that Nepal will continue to enact bans on the remaining HHPs currently available in the nation.

Process

For the past two years, Nepal has undergone major shifts in government structure—which has caused the bureaucratic process for banning pesticides to become less clear. However, Dr. Dilli Ram Sharma—Chief of Nepal's Plant Quarantine and Pesticide Management Center and a longtime government official and partner of CPSP—advanced the ban on dichlorvos and triazophos. Dr. Sharma expects the regulation to take effect within three months.

Updated data sources

CPSP has identified three sources for data collection in Nepal: the National Forensic Science Laboratory, the Central Police Forensic Science Laboratory (toxicology unit),

and eight hospitals. CPSP plans to continue collecting data from the National Forensic Science Laboratory and Central Police Forensic Science Laboratory for another 6-12 months.

Combined data from these three sources have indicated that the compounds responsible for most pesticide suicides in Nepal are dichlorvos and aluminum phosphide—the latter of which releases lethal phosphine gas but has not been classified by WHO due to its status as a fumigant rather than a pesticide. Large case series, particularly from North India, have demonstrated a case fatality rate (CFR) for dichlorvos of approximately 20% and a CFR for phosphine of 50-60%.

Some data sources have also identified chlorpyrifos as a pesticide responsible for significant suicide in Nepal. While chlorpyrifos is often formulated for low toxicity, it is sometimes combined with cypermethrin, which tends to result in a significantly higher overall concentration of toxic compounds in the pesticide (five to ten times the concentration). Banning or lowering the concentration of these combination chlorpyrifos and cypermethrin pesticides could significantly reduce suicides in Nepal.

National Forensic Science Laboratory

Nepal's National Forensic Science Laboratory analyzes blood samples from a portion of individuals in the nation that have died by suicide using pesticides. It is able to identify compounds responsible for death at the molecular level and has identified dichlorvos, aluminum phosphide, and chlorpyrifos (either alone or in combination with cypermethrin) as the three compounds responsible for the majority of pesticide suicides in Nepal—with dichlorvos in particular responsible for close to 40%.

Central Police Forensic Science Laboratory

The Central Police Forensic Science Laboratory tests a larger number of blood samples than the National Forensic Science Laboratory but is under-resourced and is only able to identify classes of compounds responsible for death (e.g. organophosphates).

Nepal's police laboratory identified organochlorines as a class of compounds responsible for a significant portion of pesticide suicides in the nation, which CPSP finds implausible (organochlorines have largely been banned in Nepal—the last [dicofol] was banned in 2019). Therefore, for the next 10 blood samples in which the lab identifies organochlorines—it has agreed to conduct a second analysis at the molecular level to determine the specific compound responsible. CPSP is also in ongoing discussions with the police laboratory regarding a broader plan for systematically testing a portion of blood samples at the molecular level without incurring significant additional costs.

CPSP believes that if the police laboratory is able to match the data of Nepal's national laboratory, a sufficiently large number of blood samples can be analyzed to

concretely determine the specific compounds responsible for pesticide suicides in the nation.

Hospitals

CPSP has collected data from eight hospitals in Nepal on approximately 1,200 attempted pesticide suicides—relatively few of which resulted in death. Data from the hospitals indicate that dichlorvos, chlorpyrifos, and cypermethrin are the compounds responsible for most of these attempted pesticide suicides—which confirms data from the National Forensic Science Laboratory.

CPSP returned to two hospitals to conduct data audits, which confirmed the earlier results it had collected from the hospitals but which were difficult to perform due to lack of electronic recordkeeping. Although data from these eight hospitals in Nepal may not be comprehensive, CPSP believes that it is important to continue collecting information on current pesticide suicide patients.

Plans for the future

1. **Improving police laboratory data quality** – CPSP believes the primary remaining challenge for its work in Nepal is the lack of resources within Nepal's Central Police Forensic Science Laboratory. It would like to be able to understand the cause of death at a molecular level for every blood sample analyzed.
2. **Banning aluminum phosphide** – Based on the data CPSP has analyzed, aluminum phosphide is the last remaining HHP responsible for a large number of pesticide suicides in Nepal. CPSP believes that a ban on aluminum phosphide could cause a 40-50% reduction in pesticide suicides and hopes to soon begin discussions with Nepal's Pesticide Registrar and other stakeholders regarding potential regulations. CPSP believes it may be able to apply India's approach to managing phosphine-related deaths, which have decreased in the nation over the past two decades, to Nepal.
3. **Analyzing the effect of the dichlorvos ban** – CPSP expects the dichlorvos ban in Nepal to result in a 20-30% reduction in pesticide suicides. However, it will need to determine the appropriate monitoring system to accurately reflect the effect of banning dichlorvos. It also hopes to more deeply analyze retrospective data on pesticide suicides from the past 20 years to understand the effect of previous pesticide bans (on e.g. methyl parathion, monocrotophos, phorate).
4. **Analyzing its impact** – CPSP plans to soon begin writing an annual report which will explain the impact of its work in Nepal over the past two years, and it is confident that it will be able to generate a three-year impact analysis in late 2020.

Progress in India

Pending approval from the Indian Council of Medical Research

CPSP is continuing to await approval from the Indian Council of Medical Research (ICMR), which it must receive before it is able to initiate data collection in India.

Technical assistance work in Maharashtra

After Yavatmal (a city in eastern Maharashtra) experienced an epidemic of occupational pesticide deaths in 2016, Maharashtra's Chief Medical Advisor approached CPSP with a request for assistance. Following this request, CPSP signed an official memorandum of understanding with the Maharashtra state government to help improve management of pesticide poisoning. Specifically, CPSP is compiling data on pesticide suicides in Maharashtra, which will be reformatted and presented to the government to inform decisions on pesticide regulation. It hopes to employ an individual directly in Mumbai to conduct this work.

Data sources

Blood samples from a portion of individuals in Maharashtra who have died by suicide using pesticides are collected and sent to toxicology laboratories in the state for analysis. CPSP believes this sampling process is unlikely to be systematic and therefore expects any trends in this data to be largely representative.

CPSP expects to receive access to this data through the Chief Minister of Maharashtra and, following analysis of the data, plans to work with the Chief Minister and the Food and Agricultural Organization of the United Nations (FAO) to develop the appropriate pesticide regulations.

Enacting pesticide regulation

Currently, pesticide regulation in India can only be enacted at the national level. However, the Kerala government has been able to enact state-level bans on certain pesticides using other regulatory tools, which has resulted in an 80% reduction in pesticide suicides in the state.

CPSP would work together with FAO to provide advice to the Maharashtra government on the possible legislative strategies for pesticide regulation.

Global campaign

Specific activities that CPSP has undertaken or plans to undertake as part of its global campaign include drafting WHO pesticide guidelines, proposing a World Health Assembly (WHA) resolution, and producing short films.

Drafting WHO pesticide guidelines

CPSP has drafted two WHO pesticide guidelines, one for pesticide regulators that emphasizes the benefits of pesticide regulation on human health and another for management of pesticide poisoning cases. Additionally, the FAO/WHO Joint Meeting on Pesticide Management—the key group responsible for setting standard practice

on global pesticide use—has agreed to establish a guideline on prevention of pesticide suicides, which Professor Eddleston will author. WHO is also considering the idea of designating pesticide regulation as a "best buy" (i.e. highly cost-effective intervention) for suicide prevention.

Professor Eddleston believes that WHO and FAO campaigns and guidelines have significant influence on national-level policy. Contingent upon finalization of CPSP's proposed guidelines, it plans to convene small meetings with key policymakers from India and China in order to determine how best to help the guidelines become effectively adopted in these two countries.

Producing local language short films

CPSP is requesting proposals for 11-12 short films (i.e. 1-2 minutes long) that succinctly and persuasively explain the issue of pesticide suicides and which are targeted at specific countries and produced in local languages (e.g. Mandarin for China, Hindi for India).

Publications

CPSP is currently working on publications to describe the effects of pesticide regulation on suicides in India and China.

Papers on pesticide regulation and suicide in India

CPSP has produced two papers that will represent the first ever published analyses of pesticide regulation and suicide in India. Its first paper, which it plans to submit for publication within the next few weeks, discusses Kerala and demonstrates that reductions in the use of HHPs in the state coincided with major reductions in pesticide suicides. Its second planned publication, a collaborative effort with researchers from India and Australia, analyzes overall suicide rates and pesticide regulation in India. CPSP plans to strengthen the accuracy of this second paper by referencing an unpublished document containing a comprehensive list of all pesticide regulations enacted in India.

Organizational structure

Staff composition

CPSP's staff is currently composed of:

- **Professor Michael Eddleston** – Professor Eddleston works for CPSP part-time and is responsible for broad oversight of publications and program operations (primarily in India, Nepal, and China).
- **Dr. Leah Utyasheva** – Dr. Utyasheva, CPSP's Policy Director, is a full-time equivalent (FTE) staff and is involved in a wide variety of activities, including operating CPSP's project in Nepal. She is currently focusing on publishing a paper on how pesticide regulation is a human rights issue.
- **Dr. Ayanthi Karunarathne** – Dr. Karunarathne, from Sri Lanka, is an FTE staff being temporarily employed at CPSP for a two-year period. She spent a

significant amount of her first year developing a better understanding of the context for pesticide suicides in Africa.

Hiring of Mark Davis

CPSP plans to soon hire Mark Davis as the Director for Agriculture & Regulatory Outreach at CPSP (working 50% of an FTE staff). Previously, Mr. Davis worked for FAO, most recently as a Deputy Director of the Climate and Environment division and, prior to that, as a Team Leader for the Pest and Pesticides Management program. He will continue to work as a part-time independent consultant for FAO.

Mr. Davis will be highly valuable for his significant experience in agriculture. Due to his long-standing relationship with FAO, Mr. Davis may also be able to better engage with stakeholders that view pesticide regulation as an environmental and food contamination issue, rather than a suicide prevalence issue. Although environmental groups are often more interested in broad pesticide bans (and CPSP is interested in banning specific pesticides responsible for suicides), it believes that aligning with these groups could be beneficial for increasing awareness of pesticide suicides and advancing legislative action.

Allocation of staff time

The following are rough approximations of the allocation of staff time to CPSP's major work areas:

- **Work in India** – 30% of CPSP's overall staff time is spent on work in India.
- **Work in Nepal** – 10-15% of CPSP's overall staff time is spent on work in Nepal.
- **Work in Africa** – Dr. Karunarathne spends close to 50% of her time on work in Africa, while Professor Eddleston and Dr. Utyasheva spend 5-10% of their time in this area. After being onboarded, Mr. Davis will also spend 5-10% of his time on work in Africa.
- **Work in Taiwan** – CPSP spends 2% of overall staff time on work in Taiwan, which primarily consists of continuing to provide funding to a local researcher, whose work is demonstrating the potential impact of a national ban on paraquat. CPSP has provided this researcher with \$30,000 to date.
- **Human rights work** – 10% of CPSP's overall staff time is spent on work related to pesticide suicide as a human rights issue.
- **Operations** – 10% of CPSP's overall staff time is spent on operations activities, such as website improvements.
- **Publications** – 10% of CPSP's overall staff time is spent on publications.

Room for more funding

CPSP is not actively fundraising, as it currently possesses sufficient funding to continue operations for slightly over one year. By April 2020, however, it would like to have begun discussions with GiveWell regarding the likelihood of receiving additional funding.

*All GiveWell conversations are available at
<http://www.givewell.org/research/conversations>*

If you or anyone you know are feeling depressed, anxious, upset, or are just needing to speak to a professional hotline counselor, GiveWell encourages you to use the following resource, available worldwide: <https://www.befrienders.org>.