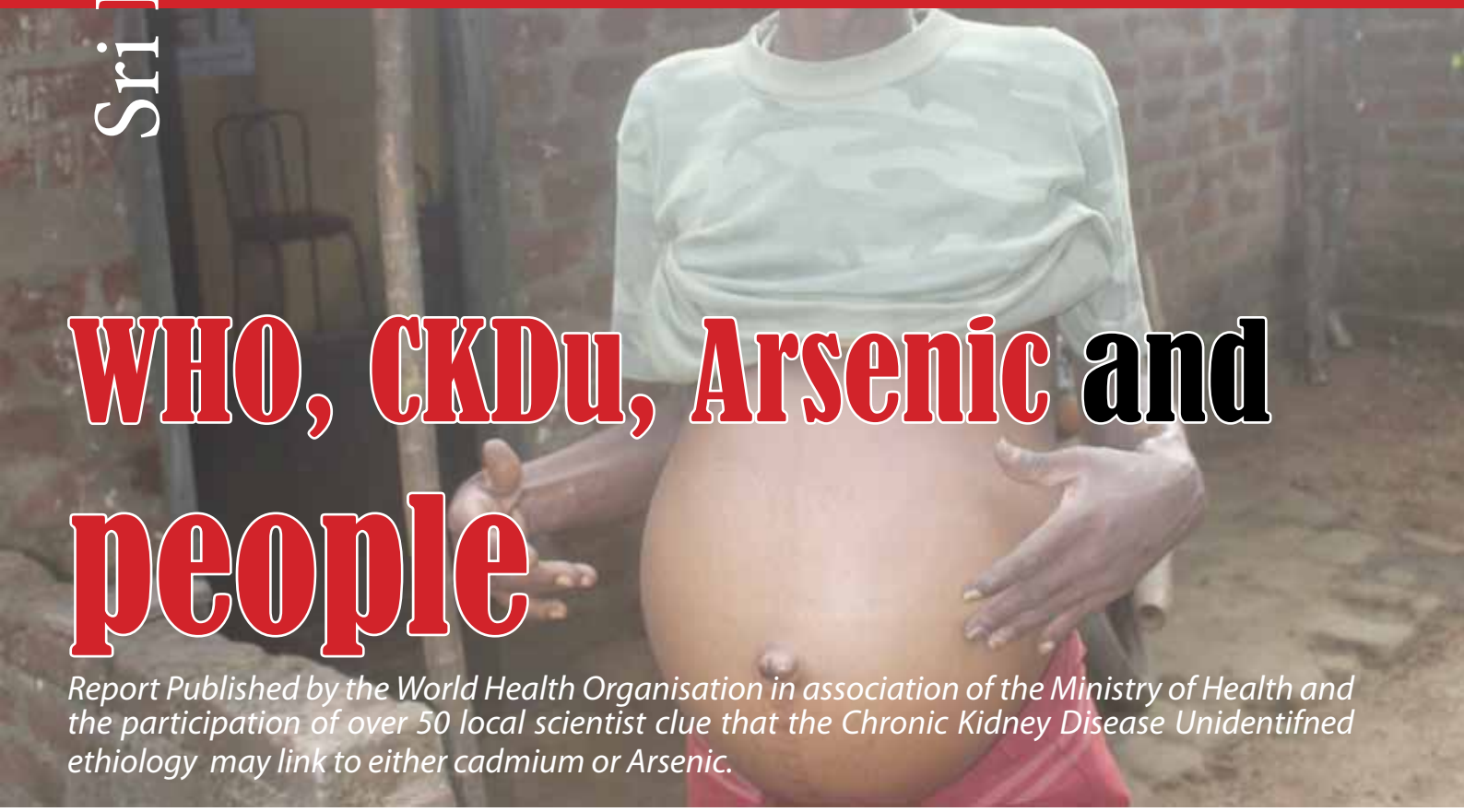
Centre for Environmental Justice/Friends of the Earth Sri Lanka

Sri Lanka TOXICSNEWS

February 2013 Issue 4



WHO, CKDu, Arsenic and people

Report Published by the World Health Organisation in association of the Ministry of Health and the participation of over 50 local scientist clue that the Chronic Kidney Disease Unidentifned ethiology may link to either cadmium or Arsenic.

The report fildings shows that they found signifl-cantly higher urine Cd concentration in healthy people in the endemic area compared to those living in a non-endemic area. People with CKDu ex-creted significantly higher levels of Cd compared to healthy people both in the endemic and non-endemic areas. Cadmium is nephrotoxic and urine Cd excretion is considered to be a reliable indicator of cumulative long term exposure to cadmium. The mean concentration of Cd in urine in people with CKDu was higher than levels demonstrated to cause oxidative stress damage to the kidney in receat sud-ies. According to the fiidings support the contention that chronic exposue to low levels of Cd may be play-ing a role in the causation of CKDu in Sri Lanka.

The report also says that the concentation of arsenic in urine in people with CKDu was above levels known to cause oxidative injury to the kidney. In people with CKDU, and in healthy people from the endemic area concentrations of As in urine and in finger nails were higher than those reported in people living in unexposed or low exposure environments. Total As level in urine is associated with chronic kidney dis-ease in a dose-response relationship especially when the level is greater than 20.74 ug/g. Co-exposure to As is likely to aggravate the effect of Cd on the kidney making the changes more pronounced than exposure to Cd alone according to the report.

It further state Serum selenium was below 80 ug/l in 38% of people with CKDu. Low selenium levels may have been a contributory factor increasing the sus-ceptibility of the kidneys to oxidative damage caused by heavy metals and metalloids.

Pesticide residues were detected in the urine of peopte with CKDu as well as people from tle control area. A high percentage of urine samples tested had detectable levels of certain pesticide residues. In the urine of people with CKDU, the frequency of detec-tion of 2,4-D, 3,5,6- trichloropyrodinol, p-nitrophenol, 1-naphthol, 2-naphthol, glyphosate, aminomethyl1 phosphonic acid (AMPA) were 33%, 70%, 58%, 100%, 65%, 28% respectively. The proportions of CKDu sub-jects with levels above reference values for different pesticide residues were: 2,4-D, (3.5%) Pentachloro-phenol (1.7"%), Chlorpjrifos (10.5%), Parathion (0%), Carbaryl (10.5%), Naphthalene (10.5%) and Glyhosate (3.5%).

Beware!-Endocrine Disrupting Chemicals at every home

Most insecticides(insect killers), rodenticides(Rat killers), Pthalates(found is many consumer goods including toys) Polybrominated diphenyl ethers, PCBs, DDT and know Endocrine desruptive chemicals. Polychlorinated dibenzo-dioxins (PCDDs) and -furans (PCDFs), polycyclic aromatic hydrocarbons (PAHs), phenol derivatives and a number of pesticides (most prominent being organochlorine insecticides like endosulfan, Kepone(chlordecone) and DDT and its derivatives, the herbicide atrazine, and the fungicide vinclozolin), the contraceptive 17-alpha ethinylestradiol, as well as naturally occurring phytoestrogens such as genistein and mycoestrogens such as zearalenone are some other examples.

Endocrine systems, also referred to as hormone systems, are found in all mammals, birds, fish, and many other types of living organisms. They are made up of: **Glands** located throughout the body, **Hormones** that are made by the glands and released into the bloodstream or the fluid surrounding cells and **Receptors** in various organs and tissues that recognize and respond to the hormones.

Disruption of the endocrine system can occur in various ways. Some chemicals mimic a natural hormone, fooling the body into over-responding to the stimulus (e.g., a growth hormone that results in increased muscle mass), or responding at inappropriate times (e.g., producing insulin when it is not needed). Other endocrine disrupting chemicals block the effects of a hormone from certain receptors (e.g. growth hormones required for normal development). Still others directly stimulate or inhibit the endocrine system and cause overproduction or underproduction of hormones (e.g. an over or underactive thyroid). Certain drugs are used to intentionally cause some of these effects, such as birth control pills. In many situations involving environmental chemicals, however, an endocrine effect is not desirable.(http://www.epa.gov/endo/pubs/edspoverview/whatare.htm)

During the UNEP Governing Council, held in February 2013, UNEP and WHO launched a report entitled State of the Science of Endocrine Disrupting Chemicals 2012.

The report presents information and key concerns for policymakers on endocrine disruptors and makes a number of recommendations to improve global knowledge of these chemicals, reduce potential disease risks, and cut related costs. These include:

1. **Testing:** *known EDCs are only the 'tip of the iceberg' and more comprehensive testing methods are required to identify other possible endocrine disruptors, their sources, and routes of exposure;*
2. **Research:** *more scientific evidence is needed to identify the effects of mixtures of EDCs on humans and wildlife (mainly from industrial by-products) to which humans and wildlife are increasingly exposed;*
3. **Reporting:** *many sources of EDCs are not known because of insufficient reporting and information on chemicals in products, materials and goods; and*
4. **Collaboration:** *more data sharing between scientists and between countries can fill gaps in data, primarily in developing countries and emerging economies.*

Furthermore, the participating organizations of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC) were invited through ICCM Resolution III/2 to lead and facilitate the cooperative actions on EDCs in an open, transparent and inclusive manner, including the development of a plan of work. UNEP and WHO will be initiating the development of such a workplan on behalf of the IOMC and will be reaching out to the ICCM4 Bureau as well as interested stakeholders in its development throughout 2013.

Chemical imports under non pesticide categories increased

Acording to the Minister of Environment and Renewable Energy, the chemical imports to Sri Lanka has increased by 317% in the past decade. The approved amount of various pesticides is over 10,000,000 kg. There are many other chemicals come for industrial use too.

According to the literature there are items that had been studied for contamination of POPs. For example; Pesticides, Insecticides, Fungicides, Industrial usage of POPs in dielectrics transformers, large capacitors, heat exchange fluids, paint additives, carbonless copy paper and in plastics, pharmaceutical treatment for lice and scabies, fire retardant in some industries, found in products such as in electric and electronic parts, fire fighting foams, photo imaging, hydraulic fluids and textiles.

Most of the pesticides have now been banned. Yet there is no source of information on pesticides already in the market or was distributed before banning. It is evident that whenever such banning notice is released, merchants sell those pesticides without the label.

According to the available data, Fungicides, Rodenticide, Disinfectants and Herbicides show an increase in the quantity of importation. These items however do not cover the chemical contained in the pesticide under the long title.

There is no control of these chemicals specially the chemicals used at home such as rodenticides and disinfectants. Because of their high toxicity, rodenticides are inherently hazardous to people, domestic animals, and wildlife.

Similarly disinfectants are dangerous for the human as well as aquatic life.

The table below shows the readily increase of these chemicals.

Table 2.1: Importation statistics of agrochemicals between 2009- 2011

	HS Code	Description	Quantity/Kg		
			2009	2010	2011
Main suspects					
1	38089190	Insecticides, not elsewhere specified(nes)	1,338,745	7,405,226	2,903,000
2	38089210	Fungicides, Excel HD 380850 contaning bromomethane	24,875	40,352	44,450
3	38089290	Fundgicides not elsewhere specified	733,235	1,180,867	1,325,926
4	38089390	Herbicides anti-sprouting products & plant growth regulators, (nes)	3,293,657	6,728,852	8,273,632
5	38089490	Disinfectants, not elsewhere specified(nes)	232,373	239,874	272,597
6	38089990	Rodenticides, disinfectants similar products etc, not elsewhere specified	77,584	92,492	123,294

Is it safe to consume Fish?

The recent talks on methyl mercury contamination in global fish and hair study arose the question on the source of contamination. The sources of mercury in the environment are; mercury related industries, broken mercury thermometers, bulbs and other items, fish contaminated with methylmercury, contaminated cosmetics, artisanal gold extraction etc. Human can be contaminated through ingestion of food sources (specially methylmercury), absorption through skin (any form of mercury), inhalation of mercury vapour, such as evaporated mercury from dental amalgams.

The study on Global Fish and Hair Community Monitoring Project in Sri Lanka was carried out by the Centre for Environmental Justice in association with IPEN. The Negombo lagoon was selected as the most vulnerable source of mercury contamination in fish. Samples of fish were collected from Thalaahena, Katunayaka and Munnakkaraya Siriwardhanapura and the hair samples were collected from the residents of the vicinity. Two fish species selected for the study were Mystus gulio (Long whiskers cat fish/ sin. Anguluwa) and Liza sp. (Mullet/ sin. Godaya).

In this the levels of methyl mercury in hair samples were recorded between 0.78- 4.45 ppm while that of fish recorded between 0.01- 0.27 ppm. In Mystus gulio the levels remained from 0.05 to 0.27 ppm while in Liza sp. The levels recorded only between 0.01- 0.02 ppm. Only the flesh or the muscle parts were used in the analysis.

In the United States, the FDA (Food and Drugs Administration) has an action level for methylmercury in commercial marine and freshwater fish that is 1.0 ppm. In Canada, the limit for the total of mercury content is 0.5 ppm. Thus comparatively these levels have not exceeded when considering a single fish. Yet, it must be mentioned that levels of ingestion surely change with the habits of fish consumption. As it vary from 18 meals per week to may be 2-3 meals per week.

However, the US National Research Council has established a "reference dose" of 1 ppm and notes that this level should not be exceeded in women of child-bearing age. The tolerable level of total mercury in hair given by the World Health Organization (WHO) is only 10 parts per million (ppm) indicating that less than this amount is unlikely to be associated with adverse health effects. But, levels of mercury above this limit in a pregnant woman correspond to a risk of harm to the nervous system of the fetus.

Therefore in consumption of fish, it is advisable to avoid eating more than one small portion (<100 g) per week of large predators like swordfish, shark, marlin and pike or never consume large halibut, cod liver, eel, shark, swordfish, or tuna, fresh or frozen or else not to consume Tuna fish more than twice a week, especially by children and pregnant or breast feeding women. But it is advisable to eat fish as they provide Omega 3 fatty acid and try to consume more of little fish.

Financial Assistance

Sri Lanka TOXICSNEWS | UNDP | SGP The GEF Small Grants Programme | gef

Published by

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