

Yogyakarta's Environmental Health in Relation to Modernization

Adiheruhusodo KRT*

Occupational Health Study Program, Gadjah Mada University School of Medicine, Yogyakarta, Indonesia

Abstract

Introduction: In Jogjakarta-Indonesia there are many activities in the rural areas, for example gold mining, iron mining, transportation and the like. There are some new things which some people may think is modernization, which will be for welfare of all.

Like the coming of RatuAdil or Mesias in the Javanese thinking as what already stated in the writing of Jayabaya the King of Kediri Kingdom which stated that the welfare of society will come someday in the future, then based on that people accept almost everything that come to their community, for instances the ideas of development, modernization, industry, transportation, migration, and the like, because of almost understood that the community can do nothing.

There are many projects, for instance traditional gold mining in Kulon Progo, electroplating home industry in Kotagede, electricity industry in Sleman, iron industry in Kulon Progo, leather industry in Kotagede, battery recycling industry in Sorosutan, and so on where there are many activities that need to be taken in relation to the health of community.

Method and discussion: This paper is developed based on library study from many researches which were already done in Jogjakarta. There are pesticide contaminations both in vegetable products and in the human blood of farmers that works in Jogjakarta, Central Java Province and Jambi Province of Sumatra; mercury inside the blood of traditional gold mining labours of Kulon Progo, mercury that contaminated to well water of the indigenous communities surround the electricity industry in Sleman-Jogjakarta, lead inside the urine and blood of labours of Jogjakarta's bus transportation, bacteria inside river water that lays near to traditional rural living areas of Central Java. In relation to the above problems then there are minamata diseases, lead intoxications with the symptoms of plumbism, and so on.

Conclusion: There are many community health problems especially among the communities, and there is a need to have the best solution to be implemented in the fields to achieve the best health level of the community in Yogyakarta, Java, Indonesia.

Keywords: Yogyakarta community; Metal; Labor; Pesticide; Health; Mercury

Introduction

It seems quite funny when someone consider about the topic of this paper, because of Jogjakarta is an educational city where there are many universities and foreigners come to Jogjakarta and living in there, and therefore the senses and the touches of modernization should be high and it presumably give no problems.

Actually, in Jogjakarta there are many public health problems in relation to many things that run recently, for example:

- Industrialization
- Modernization
- The increase of total number of transportation
- The increase of information
- The increase of total number of schools and universities, which is the number of universities are more than 120 universities
- The increase of communication
- The change of culture from traditional of Javanese life into modern life
- The increase of economic or income level, etc.

Some people may be say that there are so many benefits they have because of the above changes and situations, on the other hand, some

people tend to say that they have some difficulties because of the above changes and situations, and others may be do not understand at all about what they already have happened to them even a word.

In the context of environmental and occupational health and family medicine sciences, actually there are many aspects that can be learned, for example the influences of mining or industrialization and modernization to the community health level, because of some reasons:

- The low level of medical services for the traditional mining labors
- The low salary of traditional mining labors, and therefore because of that they cannot have a nutritious food, an adequate of health services, do not have a good chance to have an adequate of Personal Protective Equipment, for example helmet to protect the head, mask to protect the lung, earplug to

*Corresponding author: Adiheruhusodo KRT, Occupational Health Study Program, Gadjah Mada University School of Medicine, Yogyakarta, Indonesia, Tel: 0274-566295; E-mail: adiheruhusodo@gmail.com

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protect the ear, glove to protect the hand, shoes to protect the legs, eye glasses to protect the eye, and the like.

- The low understanding in the use of Personal Protective Equipment (PPE)
- The coming of modernization to the rural communities where there are many traditional minings are running, and therefore there were the changing of people life style that tend to be modernized or were trying to be modernized
- Where there are air, soil, water, vegetables, fruits and animals are polluted by heavy metal due to the operational of traditional mining in the rural mountainous area
- Do not have an adequate chance to have a good information
- The low level of facilities in the rural communities compare to the urban facilities, for example communication facilities, transportation facilities, qualified medical services, qualified public health services, so on, etc.

In relation to the above problems, where there are many difficulties in the context of public health services, because of the health services that give by the Puskesmas or The Public Health Centre (PHC) are always the curative services.

Based on the above problems and ideas, therefore there is a need to write down this paper which hopefully can be studied by many other researchers, policy makers, politicians, environmentalists, industrialists, Non-Governmental Organization, and the like.

Results and Discussion

Below is an example of Mercury (Hg) contamination in Kalirejo village of Kulon Progo regency, Jogjakarta where total number of people of Kulon Progo were 5.559, where the threshold value of Hg is around 5-10 ug/liter, but in fact the highest number of Hg inside the workers blood was 13.7 ug/liter and 76.92% of workers were already contaminated, and on the other hand the highest number of Hg inside the blood of people surround the Gold mining in Kalirejo village of Kulon Progo Regency of Jogjakarta Province is 11.8 ug/liter, and 56.18% of villagers were already contaminated.

When we took a look the data of what the way of life of community surround the gold mining in Kalirejo Village, then actually there were many cases that gave some proofs about the change of life of traditional people of Kalirejo village which was already moved into what the so called as "Modernization" where in their daily life they used whitening cosmetic, whitening soap, disinfectant and whitening body lotion which actually Hg (Mercury) was inside the above modern materials (Table 1).

No.	Foreign Materials to human body	Yes		No		Total	
		Number	%	Number	%	Number	%
1	Whitening cosmetic	4	4.5	85	95.5	89	100
2	Whitening soap	2	2.2	87	97.8	89	100
3	Whitening body lotion	8	9	81	91	89	100
4	Fungicide	-	-	89	100	89	100
5	Wood Preservative	-	-	89	100	89	100
6	Disinfectant	1	1.1	88	98.9	89	100

Source: ADKL Team of Jogjakarta Province [1]

Table 1: The use of foreign materials in human body among people (Villagers) in Kalirejo Village, Kokap Municipality, Kulon Progo Regency, Jogjakarta Province, 2004.

	+	-	Total
Labours	33	0	33
People	19	19	38
	52	19	71

Relative Risk(RR) = 2.00 (1.46< RR <2.75) and P value = < 0.05

Chi Square = 20.05

Yates Correction = 0.0000075

Table 2: Pb exposure risk.

No	Name of person	Pb (Umol/liter)
1	A	0.14157
2	AB	0.51482
3	ABC	0.28315
4	ABCD	0.09009
5	ABCDE	0.06435

Source: Husodo et al. [2]

Table 3: Lead (Plumbum) content inside blood of people of Sorosutan village, Jogjakarta City in 1998.

Sorosutan village, which is so close to Kotagede Village which was a handicraft or art village in Jogjakarta city there were some traditional industries of battery recycling process which the workers were threatened to be contaminated by lead or Plumbom (Pb), where the threshold value of Pb is 0.10 mg/100 cc or 60 Ug/100 g or 0.07 mg/100 ml [2].

Research that run among the workers and community surround the above battery recycling of traditional industries in Sorosutan given a result that : the content of lead among the blood of workers were twice compared to lead inside the blood of community, and the number was statistically significant (Table 2).

The question was why the content of lead among the community was quite high, eventhough they did not work in the battery recycling industries? The answer was because of the people of Sorosutan have already changed their way of life into modern life style, for instance: using car which used lead inside its gasoline, using motor cycle which used lead inside its gasoline, using paper that contaminated by lead, pencil and the like which were having lead inside.

Other then the above reasons, in fact the method that used by the battery recycling industry in managing their wastes were not in a good way, for example the dust of battery were flying out to the community ambient, the noise was very high, and so on.

The name of respondents were changed into alphabet of ABCD for the sake of ethical's research. Table 3 is showing that eventhough the people just living surround the battery recycling industry and they did not work inside that traditional industry, but in fact the content of Lead inside their blood was quite high, eventhough the total number of Lead was still below the treshold value.

The fact that should be taken into mind is that eventhough the data was taken cross-sectionally or point time data, and the result was giving information that the content of Lead (Plumbom) inside blood of workers and also blood of people surround the industry were below threshold level, but it will come to the accumulation health impact of Lead intoxication if the Lead inside the human body will be measured prospectively or longitudinally.

The increase of Indonesian population is the most reasonably chance for Indonesian farmers to produce fruits and vegetables, for example corns, rice, onion, potatoes, peanuts, cucumber, mango, jack fruits, banana and so on, but in fact they use pesticide in their fields and also in the market (pesticide shop), therefore there are many cases of

No	Name of workers	Pb (Umol/liter)
1	X	0.56630
2	XY	0.81084
3	XYZ	0.72075
4	XO	0.33463
5	XOO	0.46334

Source: Husodo et al. [2]

Table 4: Lead (Plumbom=Pb) content inside the blood of battery recycling workers of Sorosutan, Jogjakarta City in 1998.

Level of Cholinesterase	Bantul		K. Progo		G. Kidul		Jambi		Magelang	
	Jogja		Jogja		Jogja		Sumatra		Magelang	
	2007		2006		2006		2006		2002	
	(Farmer)		(Farmer)		(Farmer)		(Seller)		(Farmer)	
	N	%	N	%	N	%	N	%	N	%
75-100% (Normal)	5	10	50	100	48	96	29	80.5	80	38.10
50- 74% (mild)	36	72	-	-	2	4	7	19.5	130	61.90
25- 49% (medium)	9	18	-	-	-	-	-	-	-	-
- 24% (heavy)	0	0	-	-	-	-	-	-	-	-

Sources: Mardani; Mualim; Supriatna et al.; BLK DIY [3,5-7]

Table 5: Cholinesterase content in the blood of people of Jogjakarta Province, Jambi Province of Sumatra & Magelang Regency of Central Java, Indonesia.

pesticide contamination among the Indonesian farmers and the sellers of pesticide [3].

The content of Lead inside the blood of workers were higher than that of the content of Lead inside the blood of people surround the battery recycling industry. Based on the Table 4, it can be understood that because of the pollution from the battery recycling industry then Lead particle, dust, and so on contaminated to the people surround the industry.

Table 5 is saying that human blood samples which taken from many areas in Indonesia, including Jogjakarta Province of Indonesia, Magelang regency of Central Java of Indonesia and Jambi Province of Sumatra- Indonesia, actually there were polluted by pesticide in their blood.

In general, there is a need to study in more specific about the chemical contamination into agriculture life in relation to food, water, soil, air, animal which then directly and indirectly giving negative health impacts to human.

In a brief, it can be say that Table 5 is giving some information that development in general or the economic development in the context of population studies has 2 (two) influences to the population, that is positive impacts and negative impacts to the human population.

Heyrman [4] says that family medicine services can be applied in the situation above, because of the family doctors will not give the clinical curative medical service only, they will work in the context of health promotion, health prevention and health protection, medical curation, disability limitation and health rehabilitation which all of the above mentioned in the principles of family medicine as below:

1. Patient Centered Care
2. Specific Problem Solving Skills
3. Primary Care
4. Continuing Care
5. Holistic Approaches
6. Community Orientation
7. Contextual Aspects
8. Attitudinal Aspects
9. Scientific Aspects.

Conclusion

Economic development, for example Traditional mining activities, transportation, battery recycling industry, and the like in Jogjakarta [5] and Central Java and Sumatra, Indonesia directly and indirectly will bring modernization or new way of life style and informal occupation to the people, and after that many things exist both positive and negative development impacts, including the health impacts to the community [6].

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