

HEALTH IMPACT ASSESSMENT DUE TO PRODUCING INDUSTRY

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1. INTRODUCTION

According to WHO 85/102 diseases caused by environment and in 2006, there are 24% diseases and 23% deaths from environment. Prevalence and deaths of environmental diseases was 25% in developing countries and 17% in developed countries.

Quantification of the effects of environment on health is very helpful in providing information and bases for implications and planning for sustainable socio-economic development. Therefore, investigation and statistics of EHIA caused by industrial chemicals have been implemented as a pilot program.

By the document of the Vietnam Environment Protection Agency, TS Ward was one of the places where related many environmental pollution chemicals - TS were amongst 22 enterprises in VT Industrial Zone caused environmental pollution, directly affected the community health. It's necessary to have measures to protect environment, reduce environmental pollution affecting community's health in this area. Therefore, TS ward was chosen for this study

This study was conducted from designing and planning for investigation, selecting methodology for assessment to activities to improve awareness and making recommendations for management and controls of environmental risks, in TS area.

2. OBJECTIVE

1. Assessment an environmental pollution level of TS. ward
2. Investigation an environmental pollution 's effects on community health and it's relation

The result of this study is considered as a tool for HIA policy change

3. SUBJECTS AND METHODS

3.1 Subjects

- Environmental factors:
 - Some environmental factors of enterprises
 - Some environmental factors in community of these wards
- People's health:
 - 2722 households in total (8780 people)
 - People lived in TS ward (polluted area): 4813 people
 - People lived in GC ward (less polluted area - compared area): 3967 people
 - Workers belong to enterprises located in VT. South (PT. province)

3.2. Methods and contents

- Environment
 - Measurement some environmental factors (air and waste water) in TS ward and GC ward
 - Review data some environmental factors of enterprises (temperature, humidity, air velocity, toxic gas...)
- Health
 - Review data about health:
 - + From health commune: Acute diseases, chronic diseases, deaths...
 - + Enterprises
 - Interview people lived in TS ward and GC ward:
 - + Acute diseases
 - + Chronic diseases
 - + Deaths
 - + Some irritated symptoms
 - + Feeling of environmental pollution level
 - Deep interview

3.3. Analyses

SPSS program and medical statistic were used

4. RESULTS

4.1. Environment

4.1.1. The environment of TS ward and GC ward

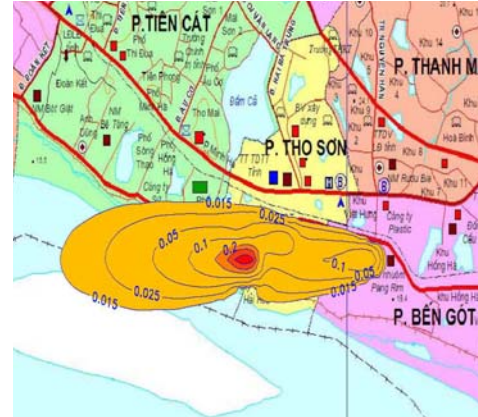


Figure 1 and 2. Distribution of dust and CO₂ concentration from high discharge in summer

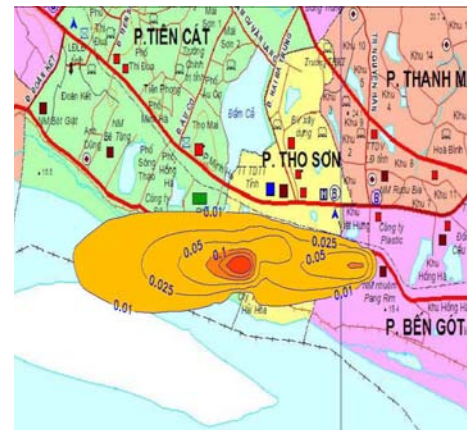
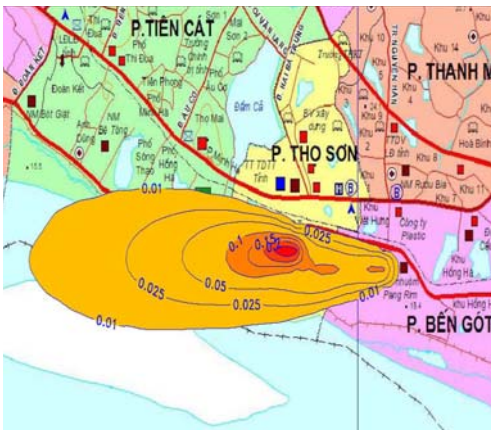


Figure 3 and 4. Distribution of SO₂ and NO₂ concentration from high discharge in summer

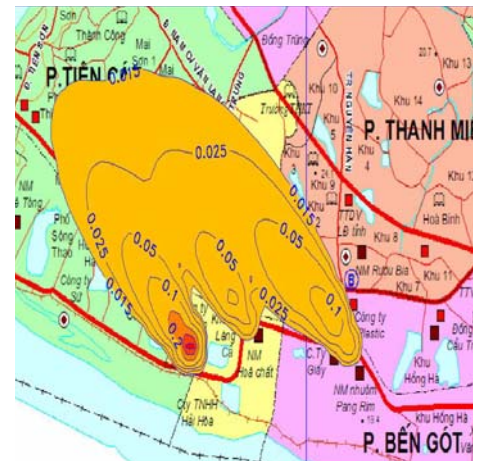
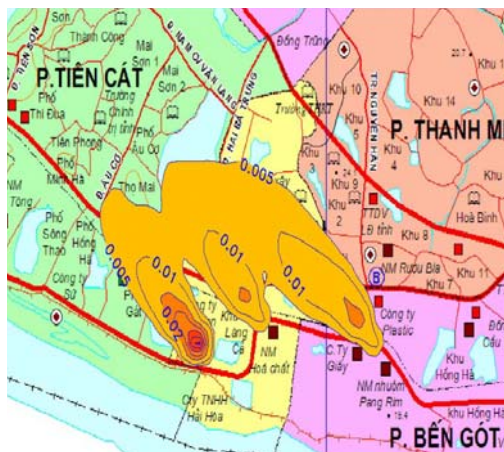


Figure 5 and 6. Distribution of dust and CO₂ concentration from high discharge in winter

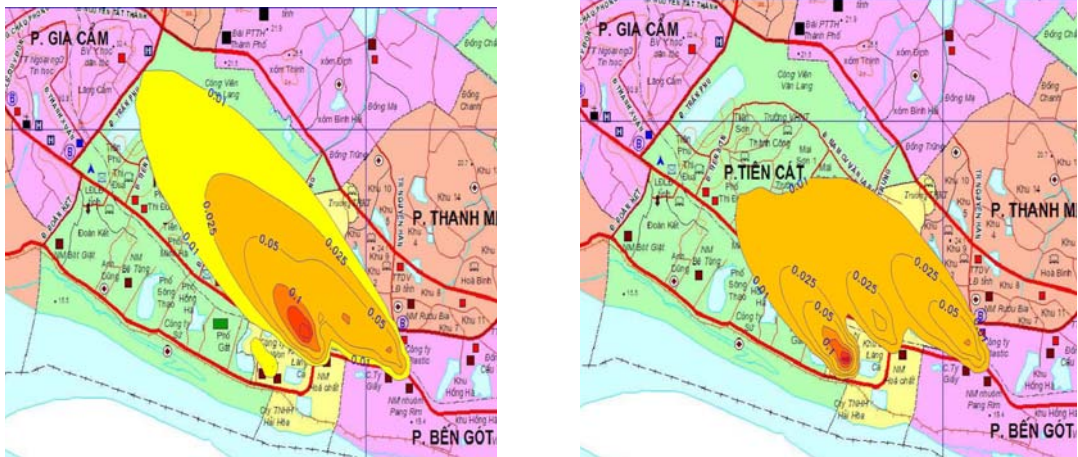


Figure 7 and 8 Distribution of SO₂ and NO₂ concentration from high discharge in winter

Some finding:

- In TS ward (Site 5): Dust tsp and PM10 concentration was higher than the standard, TSP dust concentration was 1.4 times higher than the standard, the PM10 dust concentration was 1.3 times higher than the standard.
- In GC ward (Site 12): TSP dust concentration was 1.03 times and PM10 was 1.13 time of the standard

4.1.2. The environment of enterprises in VT province

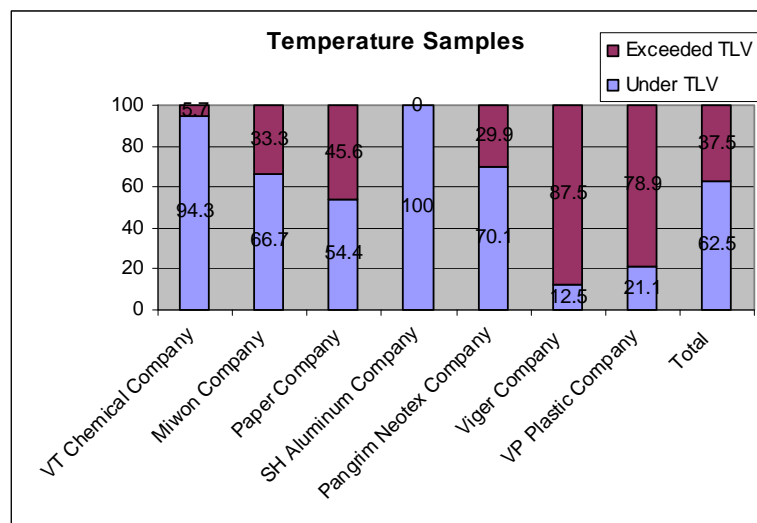


Figure 9. Temperature samples of enterprises in VT province

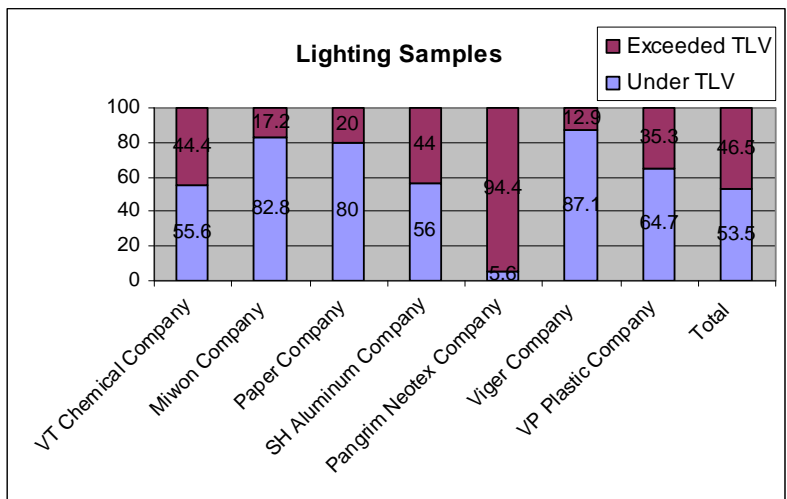


Figure 10. Lighting samples of enterprises in VT province

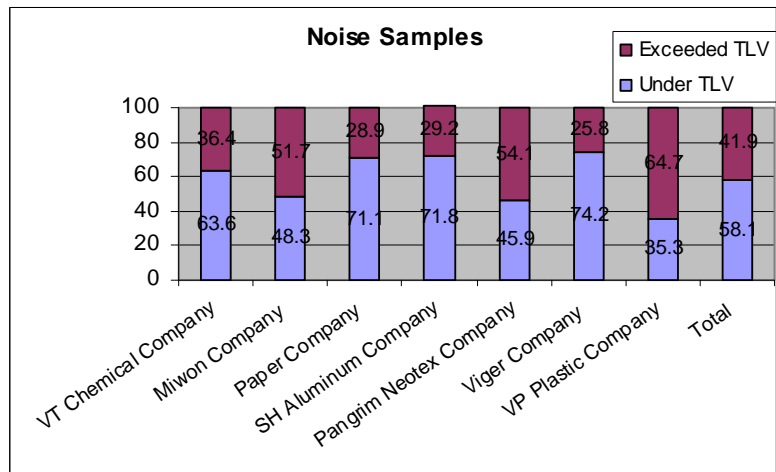


Figure 11. Noise samples of enterprises in VT province

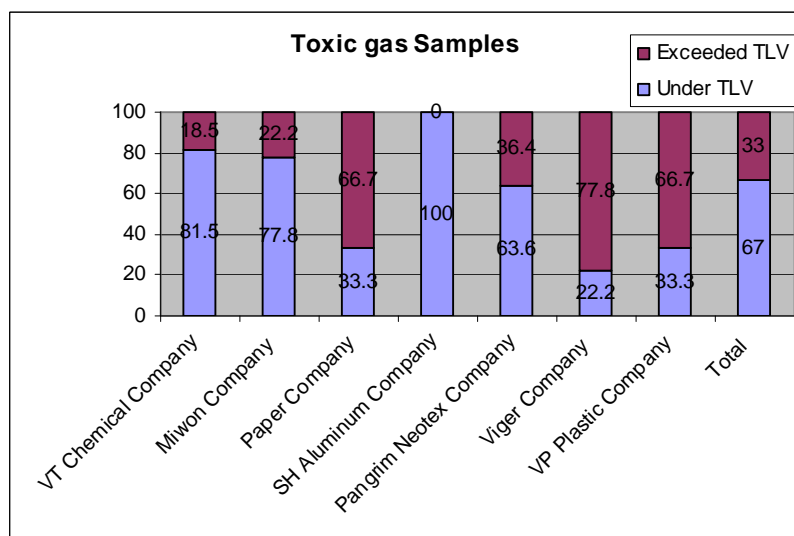


Figure 12. Toxic gas samples of enterprises in VT province

Some finding:

According to general statistics, exceeded working environment samples are: temperature (37.5%), lighting (46.5%), noise (41.9%) and toxic gas (33%). Samples of the humidity, the air velocity and the dust at the time of the measurement are in allowable criteria.

4.2. Health

4.2.1. Community health

Table 1. Demographic information

Ward	No of households	Pop.	Male		Female	
			n	%	n	%
TS	1472	4813	2338	48.6	2475	51.4
GC	1250	3967	2066	52.1	1901	47.9
Total	2722	8780	4404	50.1	4376	49.9

This study was carried out on 2722 households with 8780 people (4813 people lived in TS ward and 3967 people lived in GC ward). Male and female is approximate.

Table 2. Acute diseases

Disease/Symptom	Prevalence (%)		OR (95% CI)	ARP
	TS	GC		
Cough, running nose <1 week	8.2	2.9	3.0 (2.42-3.73)**	66.7
Cough >1 week	5.4	0.4	16.06 (9.16-28.70)**	93.8
Dyspnea	2.2	0.2	11.36 (5.36-25.14)**	91.2
Cough with sputum	1.2	0.2	6.25 (2.88-14.12) **	84.0
Sore eyes	0.9	0.3	3.57 (1.73-7.57) **	72.0
Vegetative nervous system disorder	7.0	2.4	3.09 (2.44-3.92)**	67.6

Prevalence of some acute diseases/ symptom of TS people are higher than that among in GC people significantly.

Table 3. Chronic diseases

<i>Disease/Symptom</i>	<i>Prevalence (%)</i>		<i>OR (95% CI)</i>	ARP
	<i>TS</i>	<i>GC</i>		
Respiratory system	4.8	1.5	3.28 (2.44-4.42)	69.5
Sinusitis	3.1	0.7	4.60 (2.99-7.10)	78.3
Chronic sore throat	6.4	1.0	6.93 (4.90-9.85)	85.6
Hypertension	5.6	1.6	3.57 (2.69-4.74)	72.0
Circulation system	0.3	0.1	2.15 (0.71-6.89)	-
Sore eyes	0.8	0.2	3.59 (1.67-7.97)	72.1
Nervous system	1.2	0.2	6.78 (2.98-16.25)	85.3
Digestive system	0.5	0.6	0.93 (0.51-1.69)	-

The same with acute diseases, in TS ward, the rate of people's chronic diseases also higher than that among people of GC ward.

Table 4. Deaths

<i>Disease/Symptom</i>	<i>Prevalence (%)</i>		<i>OR (95% CI)</i>	ARP
	<i>TS</i>	<i>GC</i>		
Cardiovascular	8 (0.17)	5 (0.13)	1.32 (0.39 – 4.63)	-
Cancer	18 (0.37)	4 (0.10)	3.72 (1.19-12.98)*	73.1
Lung cancer	9 (0.18)	0	-	-

According to the result of investigation as well as review data from health community, the prevalence of deaths caused by cardiovascular and cancer in TS ward. Especially having 9 death cases caused by lung cancer in TS ward and nobody in GC ward. Many authors have found the relation between environmental pollution and diseases/ death in their researches.

4.2.2. Worker's health

Table 5. Classification the worker's health of enterprises

Classification	n=307	n=281	n=771	n=152
I level (%)	6.5	9.5	14.0	21.0
II level (%)	56.4	46.6	49.7	50.6
III level (%)	30.9	33.5	31.5	23.7
IV level (%)	5.5	9.8	4.5	4.6
V level (%)	0	0.4	0.2	0

The result of clinical examination showed that: generally almost worker's health is 'good level' (I level and II level), only some workers has IV level and IV level (<10%).

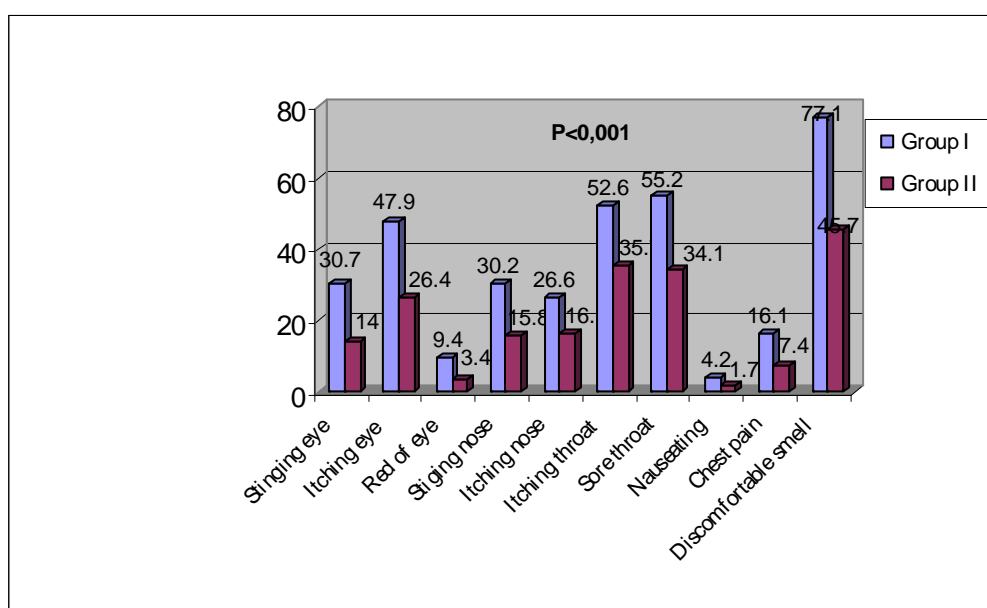


Figure 13. Some irritated symptoms in workers

4.3. The environmental pollution and some symptoms

Table 5. Environmental pollution and some symptoms

<i>Health problem</i>	<i>Discomfort able smell</i>	<i>Dust pollution</i>	<i>Waste water pollution</i>
Irritated eye	*	*	*
Sneezing		*	*
Throat symptoms	*	*	*
Dyspnea	*		*
Skin symptoms	*	*	*
Headache	*		*
Nauseate	*	*	*
Dizzing	*		*
Tired		*	
Chest pain	*	*	*

CONCLUSION

1. TS ward were Industrial Zone caused environmental pollution, directly affected on the community health
2. There is the relation between community health and environmental pollution in the industrial zone.

RECOMMENDATION

It's necessary to apply some solutions to reduce the environmental pollution due to industrial producing and protect people's health.

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