Effect of Particulate Outdoor Air Pollution on Road Side Vendors
(A comparative study of urban and rural areas Gujrat)

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ABSTRACT: This study presented the cause of vehicle air pollutant emissions, $PM_{2.5}$, NO_2, Ozone, CO and total VOCs on the health of street vendors' compression between urban and rural areas. . Traffic pollution is dominating and significantly involves in the urban air quality hitch especially in roads of compact traffic. Traffic congestions give rise to traffic pollution, and hence disturbs public health, and may cause frustration mainly for that work, or live in huge traffic. The data was collected from rural and urban areas. Urban has more ambient air and it is more effect to urban peoples than the rural vendors. The theoretical frame work of kunzli et al used to explain relation between air pollution and its effect on pollution. It was also concluded by statistical analysis that there is significantly urban vendor is more effected than the rural venders. The best way to decrease the adverse health effect of traffic-related air pollutants of road vendors is to decrease the vehicle exhaust emissions. It needs to give awareness among people about the adverse effect of air pollution. The use of protect masks must common among the people. It should be need to planted tree along the road to reduce somehow effect of air pollution.
Key word: Outdoor, Air Pollution, Noise Pollution, Road Vendors, Urban and Rural Areas

INTRODUCTION

In the past, the main cause of poor air pollution was industrial processing and domestic heating. Now traffic pollution is dominating and significantly involves in the urban air quality hitch especially in roads of compact traffic. Traffic congestions give rise to traffic pollution, and hence disturbs public health, and may cause frustration mainly for that work, or live in huge traffic. Traffic transmissions and noise levels are higher in concentration, stop-and-go and resting traffic than they are when traffic is moving at a constant speed [1]. It is mostly linked with human health risk including asthma, exacerbations and other cardiovascular problem [2]. Furthermore, traffic emissions, of which , total volatile organic compounds (VOCs),particulates(PM) sulfur dioxide (SO2), and carbon monoxide (CO), have cogent effects on emergency bureau visits for asthma through children less than 2 years and older of more than 75 years [3]. According to World Health Organization, 2004 atmospheric pollution give rise to 2.4 million deaths per year around the globe [4]. Along with their adverse problems on public health, traffic emissions have also high impact on the environment and give rise to public health problems. These environmental impacts include ozone depletion, formation of troposphere ozone, greenhouse gases and acid deposition processes [5].

The air pollution includes breathing and lungs problems, aggravations of existing respiratory and heart diseases, weaken the body defense system against invade materials and damage to lung and carcinogenesis [6] Prolonged exposure to dust can results in chronic bronchial problems [7] the respiratory health effects due to vehicular pollution exposures are significantly in order to predict the risk that may cause asthmatic response [8] Generally in cities centers the residential areas are located along the roadside and populations of such areas are exposed to vehicular pollution.

Air pollution deteriorates ecological condition and can be defined as the fluctuation in any atmospheric constituent from the value that would have existed without human activity [9]. Environmental degradation exerts significant pressure on human health. Unfortunately, these conditions are closely linked with the risk to the environment and human by transport; particularly transport [10]. One of the major concern about the effect of air pollution on economy and the health have resulted in dealings to mitigate emissions of the most harmful pollutant, such as, particle pollution (acids, organic chemicals, metals, and soil or dust particles) and ozone, which affects the breathing system. In spite international and national interventions and decreases in pollutant emissions, the health effects of air pollution are not likely to minimize in the years ahead, unless positive action is taken. Health problems linked to air pollution range from minor eye irritation to upper respiratory problems, chronic respiratory diseases, such as, lung cancer, cardiovascular diseases and asthma. The aerial dust load has been increasing over the previous years due to desertification, increasing global warming and human actions [11]. Dust in the surrounding can have dominant effects on environmental ecosystems and on human

health. Environmental effects have the influence on biogeochemical courses of the earth, imprints on earth's radiation equilibrium and influence on atmospheric chemistry [12].

The environmental noise mode due to road vehicles in cities has shown huge dependence on the heavy automobile in discharge and of course vehicles speed and other factors such as ground cover. It is predicted o that long contact to low noise frequency can cause either lasting or temporal hurt to hearing. The upshot of noise on human emotion ranges from tiny through frustration and irritation to psychologically disrupting. Physiologically, noise can range from harmless to painfulness and physically injurious, [13].

The noises affect us without our being on purpose aware of it. Unlike our eyes, which we can close to keep out unwanted visual input, we cannot willingly shut our ears to bar unwanted auditory input. Our hearing mechanisms are always on even when we are asleep [14]. Noise also has been concerned in the development or heightening of different health problems, from hypertension to psychosis in people. It is estimated that half of twelve field review showed a positive correlation between noise contact and blood pressure, while the rest indicate no major effects [15].

Health effects of particulate matter

Particulate matter is remarked as the major air pollutant associated with negative health effects because systematic review have usually shown that PM is accountable for the largest attributable part of mortalities due to air pollution contact [16]. In health contact assessment, there may be no need to include other air pollutants from mobile sources such as, hydrocarbon (HC), carbon monoxide (CO) nitrogen oxides (NOx) as the combination of these pollutants are often linked with PM, and thus epidemiological studies cannot firmly allocate observed things to single pollutants, but the combined effects between PM and other pollutants instead [17].

Short-term effects v.s. long-term effects

It is normally agreed that the relatives of both short-term and long-term PM content with poor health endings have been every time observed, and thus neither of them should be rejects in risk assessment and management, there is no agreement about their affiliation and relative magnitude. Kunzli et al (2000) presents the following theoretical support to describe the relationship between the deaths attributable to long-term exposure and those derivable to short-term exposures to fine particles:
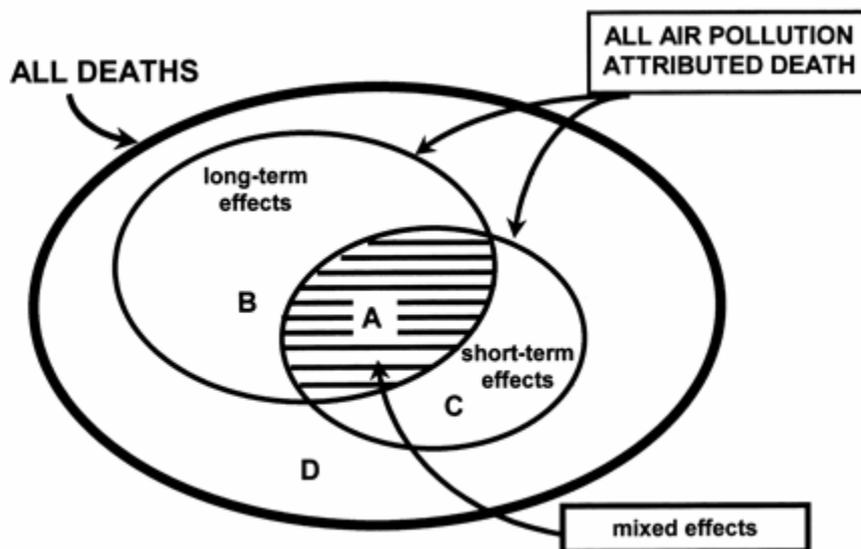

Figure 1
Source: Kunzli et al, 2000; (2) Circle sizes do not reflect relative effects.

Graphic Illustration of Deaths Due to Ambient Air Pollution in a Population

From on this graph, the authors argue that air pollution can be classified into four cases, resultant to the letters A, B, C and D in the graph: A) air pollution increase both the risk of underlying ailment leading to weakness and the temporary risk of death among the feeble; B) air pollution increases the hazard of chronic illness leading to ill-health but is not linked to timing of death; C) air pollution is distinct to risk of chronic illness but short term content increases death among persons who are weak; and D) neither underlying chronic illness nor the occasion of death is linked to exposure to air pollution. [18].

Statement of Problem

Air pollution is one of the major serious troubles faced by the peoples in the growing countries like India. The city areas of Pakistan have not only skilled a rapid growth of inhabitants but also by a growing number of automobiles. The major cause of increased release of pollutants in city areas has the use of poor fuel, traffic blocking and badly maintain motor vehicles. The shock of automobile pollution on human health in cities areas is at peak level as vehicle discharge are near the ground where people work and live. The noise problem of the past is major when linked with those qualified by advance city dweller; noise pollution continues to grow in level, rate, and harshness as a result of populace increase, urbanization, and scientific development.

Significant of study

Air pollutants have been associated to a variety of unpleasant health effects, together with respiratory infection, heart illness and lung cancer. Decline of air pollution level will decrease the global health load linked to these disease. Efforts to extensively reduce concentration of air pollutants will also help to drop off greenhouse gas emission and take the edge off the effects of global warming and Noise produce through and growing adverse impacts that weaken health and that disgrace residential, societal, working, and learn environment with equivalent real (economic) and indefinable (well-being) impacts. Chief sound effects of noise include intervention with communication; sleeplessness and reduction in competence Public teaching seem to be the most excellent technique as recommended by the respondents in solve this danger. However, NGOs and government can play a momentous role in this course. Revise will contact to in rank on the health special effects of open-air air pollution and method for dropping the risk. Its recommend to government carry out health impact assessment to settle on the enormity of the health effects linked with change in air pollution. This in a row can be used to classify cost-effective computes to improve public health, recognize critical doubts and suggest dynamic areas of research. give confidence technological modernization to decrease discharge from stationary source and conventional automobiles, and explore alternative fuels.

Objective

To study the air pollution effect on Road Venders
To find out psychological difficulties by noise pollution
To analyze comparison between urban and rural road venders effected by pollution

METHODS AND MATERIALS

The research is explanatory it is explaining the phenomena that air pollution and noise pollution has adverse effect on health specially those which spend air pollution areas and where most noise pollution occurred. The areas of study are urban and rural of District Gujrat. Data is collected from both primary and secondary source. Secondary source are Internet, New papers book etc. The theoretical frame work of kunzli et al used to explain relation between air pollution and its effect on pollution. The sample size is 300 which get from no probability sampling technique and convenient sampling is used for data collection. The areas is selected urban and rural because this is a comparative study so research find out compression between two areas that which area respondents are more effect than other areas. The research is specially conducted on shopkeeper hawker, road vendors etc, that lived and spend more time in pollutant air so data is collected from the road vendor by the well structured questionnaire is based on four part. First part is about demographic characteristics of the respondents. Second part based upon the timing which respondents spend in air and noise pollution. Respondents are also asked about safety use such as masks or head phone etc. third illustrate psychological condition of the respondents that effected by noise pollution than fourth and final part of the questionnaire is about air pollution and related disease by it. After the data collection data is classified and analyzed by the SPSS. Data is presented in graph and tables which show percentages and also hypothesis testing by the SPSS.

Data Analysis

The data is showing that majority of road vendors belong from the age group of 25-34 that is 39.7%. Male respondents are more than female male are 96.7%. Researchers have taken 50% respondents from urban areas and also 50% from rural areas. 74.7 % respondents are married. Literacy rate of the respondents are very low 27% are middle and 22% are illiterate. Researchers have collected 5% data from traffic warden and 95% from the shopkeepers. 28% and 30% respondents monthly earn 5000 to 15000 rupees only 10% have more than 26000 monthly earning. 77% respondent spends more than 1000 rupees on his monthly medicine. 41% respondents have 10 hours duty and 37% have more than 12 hours. So it means they inhale traffic smoke daily more than 8 hours. 31.3% often do job overtime otherwise respondents not feeling well to spent overtime. 50.7% respondents work on monthly wages and 31% respondent work on daily wages. 97.3% do not use protect mask. By the noise pollution there is 38% facing psychological difficulties. 53.0% have not exposure with diseases lack of finance and have not accesses to health care provider. An air pollution effect is

more on urban respondents. 55% respondents facing cough, eye and skin infection majority of respondents are urban. 18% respondents facing it from 6 month 9% have problem from 12 month and 2% have more than 1 year. 71.7% respondents go for treatment to the local doctors. 63% respondents replied that there family member are not facing similarly diseases its mean it is because of inhaling ambient air.
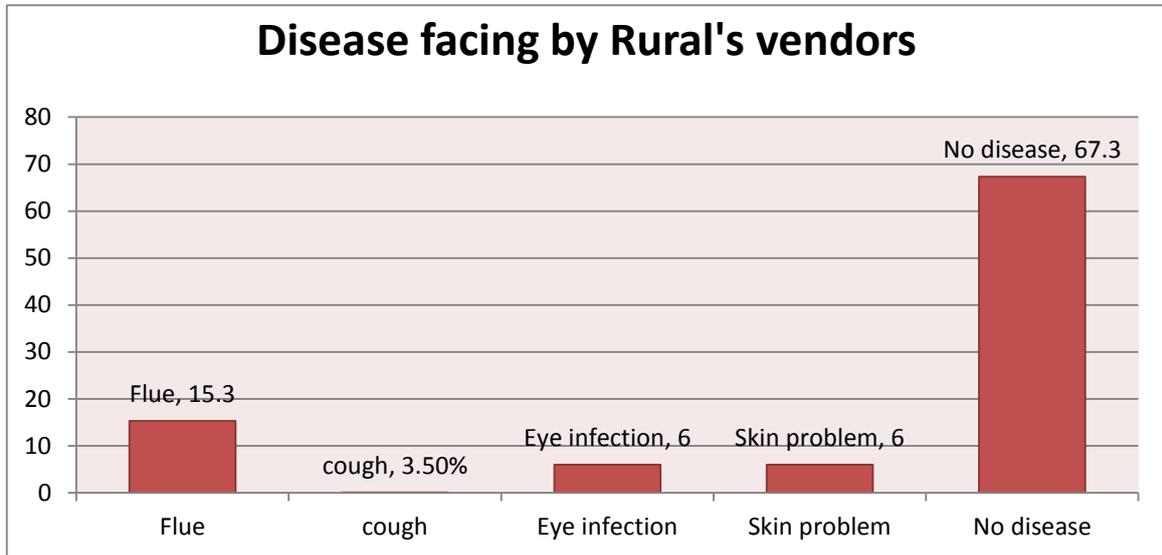

Figure 2

The Graph has Depicts Outdoor Epidemiology's Facing by Urban Road Vendors. Majority of respondents are facing Flue and Cough.

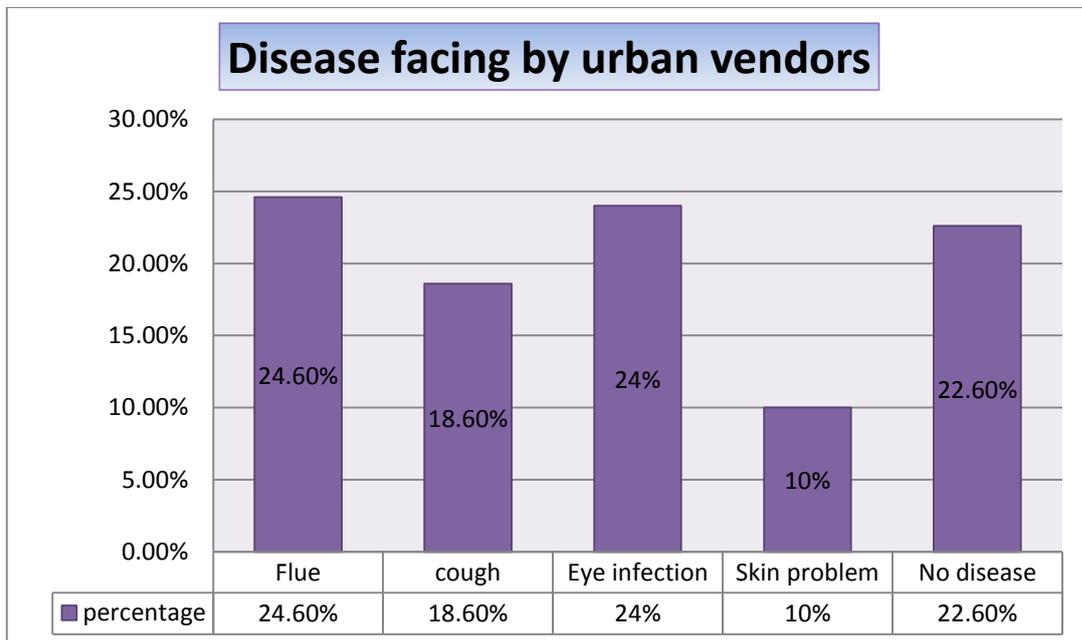| percentage	Flue	cough	Eye infection	Skin problem	No disease
	24.60%	18.60%	24%	10%	22.60%

Figure 3

The Graph has Depicts Outdoor Epidemiology's Facing by Rural Road Vendors. They are facing less diseases as compare to urban's vendors. Majority of rural has no such disease only 15% has complained about flue.

Statistical Analysis

The test statistic for an Independent Samples t Test is denoted as t, which is calculated using the following formula (assuming equal variances), and thus pooling the variances):

$$t = \frac{\overline{x}_1 - \overline{x}_2}{s_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where

$$s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

$$df = n_1 + n_2 - 2$$

Where

x_1 = Mean of first sample
x_2 = Mean of second sample
n_1 = Sample size (i.e., number of observations) of first sample
n_2 = Sample size (i.e., number of observations) of second sample
s_1 = Standard deviation of first sample (Note: once the standard deviation is squared in the equation it represents variance)
s_2 = Standard deviation of second sample (Note: once the standard deviation is squared in the equation it represents variance)
s_p = pooled standard deviation (i.e., treats variances as equal)
The calculated t value is then compared to the critical t value from the t distribution table based on a chosen confidence level. If the calculated t value > critical t value, reject the null hypothesis.

Group Statistics					
	Residential Area	N	Mean	Std. Deviation	Std. Error Mean
Physiological Difficulty	Urban	150	1.28	.451	.037
	Rural	150	1.35	.480	.039

Hypothesis
H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 \neq \mu_2$
Level of Significance:
α = 0.05
Test Statistics: Independent Samples t Test

Table 1. Comparative analysis Physiological difficulties faced by responded

		Levene's Test For Equality Of Variances		T-Test For Equality Of Means					95% Confidence Interval Of The Difference	
		F	Sig.	T	Df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Physiological Difficulty	Equal Variances Assumed	7.342	.007	-1.365	298	.173	-.073	.054	-.179	.032
	Equal Variances Not Assumed			-1.365	296.840	.173	-.073	.054	-.179	.032

Source: Aroj Bashir 2014

Interpretation

The result from the analysis indicates that there is a significant difference between urban and rural respondents. So our obtained p- value is smaller than level of significance so researcher reject null hypothesis. This table shows that urban respondents are not equally to rural respondents. Urban are facing more Physiological difficulty than rural respondents.

Hypothesis
H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 \neq \mu_2$
Level of Significance: α = 0.05
Test Statistics: Independent Samples Test

Table 2. Comparative analysis of Respondent facing health Problem by Road pollution

Group Statistics

	Residential Area	N	Mean	Std. Deviation	Std. Error Mean
Respondents are facing cough ,flue, eye and skin problems	Urban	150	1.23	.420	.034
	Rural	150	1.67	.471	.038

		Levene's Test For Equality Of Variances		T-Test For Equality Of Means					95% Confidence Interval Of The Difference	
		F	Sig.	T	Df	Sig. (2-Tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Cough, Flue, Eye and Skin Problems Facing By Respondents	Equal Variances Assumed	15.087	.000	-8.672	298	.000	-.447	.052	-.548	-.345
	Equal Variances Not Assumed			-8.672	294.242	.000	-.447	.052	-.548	-.345

Interpretation
The result from the analysis indicates that there is a significant difference between urban and rural respondents. So our obtained p- value is smaller than level of significance so researcher reject null hypothesis. This table shows that urban respondents are not equally to rural respondents. Urban are facing more problems such as , Cough , Flue, Eye and Skin
infection than rural respondents

Table 3. Cross tabulation analysis

Cross tabulation

Exposure Time With Ambient Air				Facing Most Frequently Disease By Respondent					
				0	Flue	Cough Problem	Eye Problem	Skin Problem	Total
8 Or Less	Residential Area Respondents	Of	Urban	4	25	22	16	7	74
			Rural	39	16	5	2	0	62
	Total			43	41	27	18	7	136
10	Residential Area Respondents	Of	Urban	20	8	5	7	5	45
			Rural	49	4	2	4	5	64
	Total			69	12	7	11	10	109
12 Or More	Residential Area Respondents	Of	Urban	10	4	1	13	3	31
			Rural	13	3	1	3	4	24
	Total			23	7	2	16	7	55

Interpretation
The table show cross tabulation analysis between urban and rural respondents' both are equally spent at the ambient air. But urban are mostly effect so it is concluded that urban atmosphere is more ambient than rural areas because of traffic pollution.

CONCLUSION AND RECOMMENDATIONS

This study presented the cause of vehicle air pollutant emissions, PM$_{2.5}$, NO$_2$, Ozone, CO and total VOCs on the health of street vendors' compression between urban and rural areas. . Traffic wardens and shopkeeper spent more than 8 hours in ambient air. By the result they are facing psychological difficulty such

as stress and hypertension by the noise pollution. The urbane road vendor facing more disease such as fuel. Cough eyes and skin infection more than rural areas. The best way to decrease the adverse health effect of traffic-related air pollutants of road vendors is to decrease the vehicle exhaust emissions. It needs to give awareness among people about the adverse effect of air pollution. The use of protect masks must common among the people. It should be need to planted tree along the road to reduce somehow effect of air pollution.

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