

**Solid waste — its ecoepidemiological impact***Dr Anisa B. Khan, India*

POOR HANDLING OF solid waste is an unrecognised area of community development, with the potential risk at Pondicherry alarming in terms of public health, morbidity and loss of productivity. An earlier study on children (Khan et al. 1993) exposed the risk in terms of both morbidity and mortality. An epidemiological, case-control study was conducted. An assessment of health risk on exposure to solid waste is done. A high incidence rate indicated the impact of exposures on disease frequency. An individually manageable cost-effective, waste treatment technique - vermicomposting is advocated.

Methods

Garbage dumping sites in Pondicherry town were identified. From the resident population near the dumping sites, a random sampling of case subjects who were 13 years and > 13 years of age was done. Control subjects were from the residential areas, 2.5-3km far from dumping sites. A personal interview was conducted using a closed ended questionnaire, focusing on socio-economic, residential history and morbidity aspects.

Result and discussion

Table 1 present the population employed in the study, stratified according to age-group and sex. From Figures 1 and 2 a high incidence rate (IR) for Acute Respiratory infection (ARI) among cases is discernable. IR is high among females of 46-65 years age group and among males

Table 1. Study population

Age Group (Yrs)	Cases		Controls	
	Females	Males	Females	Males
14-25 Yrs.	82	71	40	35
26-45 Yrs.	83	84	33	42
46-65 Yrs.	29	36	22	19
> 65 Yrs.	6	6	5	4
Total	200	200	100	100

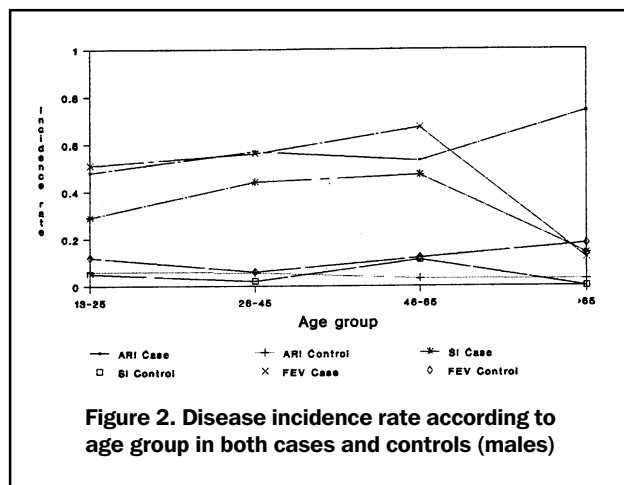
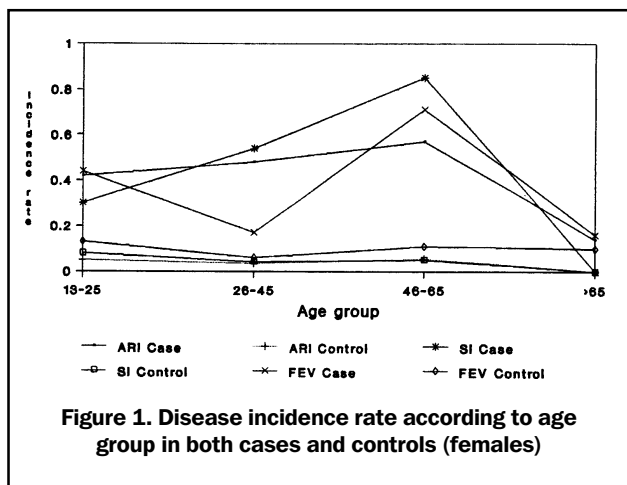
of 26-45 years age group. Symptoms are related to upper respiratory irritation, cough, breathlessness leading ultimately to chronic allergic bronchitis. A high risk ratio among males (Table 2) and a high attributable fraction (1.0 - >1.0) establishes a clear relationship of longer periods of exposures with disease frequency. Similar earlier reports were with respect to respiratory diseases and enteric dysentery (Joshi, 1995). Though IR among males >65 years. (ARI) is higher recorded, in general, the number of population (both males and females) in this age-group is too low to allow any scientific risk significance. IR for skin infection (SI) is higher among females (46-65 years) than their other age-groups and also than males. This reflects effect of longer periods of exposure since their stay at

Table 2. Risk ratio and attributable fraction for different diseases

Diseases	13-25 Yrs.				26-45 Yrs.				46-65 Yrs			
	Females		Males		Females		Males		Females		Male	
	R.R.	A.F.	R.R.	A.F.	R.R.	A.F.	R.R.	A.F.	R.R.	A.F.	R.R.	A.F.
Acute respiratory infections	8.4	0.87	8.0	0.87	13.3	0.92	10.2	1.5	8.1	0.90	17.6	0.94
Skin Infections	3.7	0.73	5.8	0.82	13.5	0.92	22.0	0.95	17.0	0.94	4.2	0.76
Fever	3.3	0.70	4.2	0.76	2.8	0.64	9.3	0.89	6.4	0.84	5.5	0.82
Eye Infections	3.3	0.70	5.0	0.80	5.8	0.82	5.0	0.80	7.6	0.86	14.3	0.93
Diarrhoea	17.0	0.94	9.0	0.88	18.0	0.94	5.0	0.88	3.5	0.71	2.3	0.57

R.R = Risk Ratio

A.F. = Attributable Fraction



residence (solid waste proximity) is of longer duration. Endemicity of skin diseases in the population is always related to their environmental variables (Brahmanath and Koshi, 1988). Increased incidence of skin rash, headaches are effects of exposures to local chemical dump (Memphis and Shelby country health Dept., Tennessee, USA - Harris et. al. 1987). A higher incidence of fever as a symptom of infection is a striking feature of study population.

Incidence rate of Eye Infection (EI) is higher among males than females except for those > 65 years (Figure 3 and 4). Symptoms ranged from burning, itching in the eyes; blood-shot eyes besides eptic and borderline atrophy. Risk ratio and etiologic fraction are both higher among males (46-65 years; Table 2) similar earlier reports include those of Harris et. al. 1987.

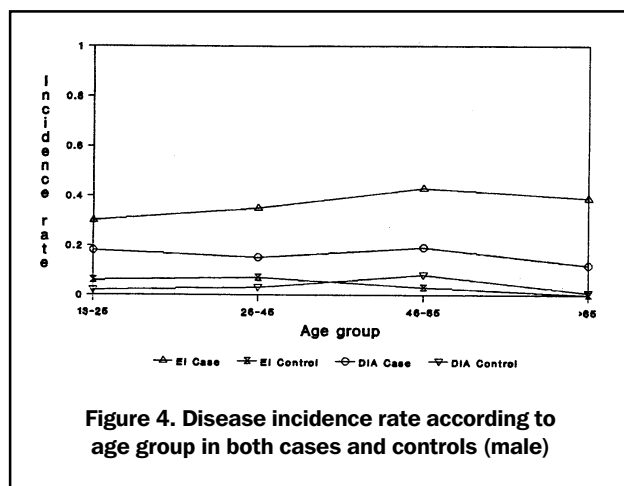
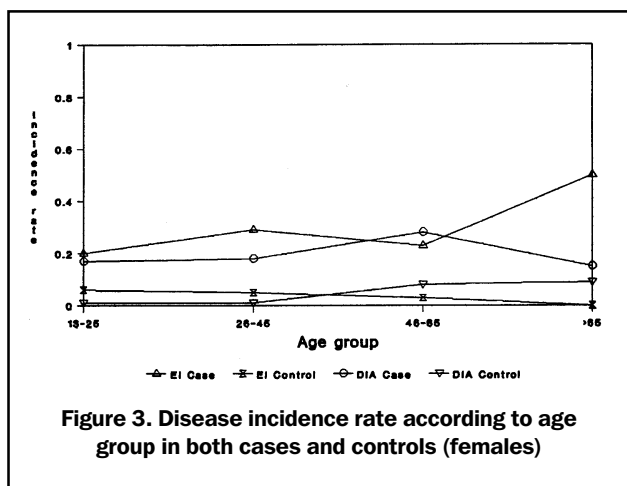
The risk ratio for diarrhoeal diseases (DI, Table 2) in the age-group of 13-25 years and 26-25 years among females is significant. This accounts partly for large infant mortality rate in developing countries. The higher AF (9.4) in both these age-groups establishes the cause-effect phenomenon. Drinking water samples contained coliforms (1000/100ml) above permissible numbers. Analysis points to post-collection contamination, which bears a direct relation to general contamination in the environment. In Madras a fre-

quent outbreak of water-borne-acute diarrhoeal diseases claim more lives (Radhakrishnan, R.K. 1995).

Managing the enormous solid waste generated demands considerable amount of funds. A pragmatic, cost-effective method of treatment (Vemicompost) is recommended. A small pit of 2mx1mx1m is prepared on ground. Above a thin layer of broken bricks and river sand, 20cms thick local soil is spread into which locally available earthworms (*Lampito mauritii*) were introduced. Another thin layer of dry leaves is spread over it. This soil is kept moist by sprinkling water. The garbage collected from the apartment is dumped into this pit. When the pit is full, it is covered with dry coconut leaves and the garbage is allowed to compost for 40 days. The compost formed is used as a natural manure.

Conclusion

Identification of health risk factors through eco-epidemiological studies help in planning preventive measures, which go to make the goals of community development more realisable. When solutions to solid waste problems are economically out of reach, vermicomposting is recommended as a least-cost solution, besides it is ecofriendly.



References

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