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The Global Problem of Environmental Pollution

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ABSTRACT: ***Exposure to environmental emissions appears to be a significant source of health threats worldwide, while risks are typically greater in developed nations, where poverty, a lack of investment in new technologies and poor environmental regulations combine to generate high levels of pollution. However, there are nuanced and sometimes poorly defined correlations between air emissions and health consequences. As a result of the lack of comprehensive control and inherent differences within any demographic group, exposure levels, for example, are often unpredictable or unclear. Exposures may occur through a variety of pathways and processes of exposure. In a broad variety of health outcomes, specific contaminants may be involved, although few illnesses are specifically due to particular pollutants. Long delay intervals, the consequences of accumulated exposures, and repeated exposures to various contaminants, all of which could function synergistically, create difficulties in unraveling environmental contamination and health connections. Nevertheless, numerous efforts have been made in recent years to quantify the global risk of disease, either in terms of deaths or disability-adjusted life years, as a result of environmental emissions (DALYs). Pollution can be attributed to around 8-9 percent of the overall illness burden, but slightly higher in developed countries. The main causes of exposure, along with indoor air pollution, are seen to be unsafe water, inadequate ventilation and poor hygiene.***

KEYWORDS: ***Pollution, Environment issue, Global concern, Contamination, Emission control.***

INTRODUCTION

Despite the substantial strides undertaken to clean up the atmosphere in recent years, contamination remains a major issue and presents ongoing health threats. In the developing world, where conventional sources of pollutants such as industrial contaminants, insufficient sanitation, insufficient waste disposal, polluted water supply and susceptibility to indoor air pollution from biomass fuels impact vast numbers of people, the problems are certainly largest. However, environmental degradation continues even in developing nations, most particularly in the poorest segments of society[1].A wide variety of new toxins have also appeared in recent decades, not least those related to road transport and the use of modern chemicals in the household, in food, for water treatment and for the control of pests. Any of these contaminants are seldom detected in extremely high quantities, but health consequences are normally far from severe or noticeable. As Taubes has observed, few of the environmental exposure concerns that affect us today suggest major relative risks. Severe research difficulties come from identifying minor effects against a backdrop of dose uncertainty and human sensitivity, and measurement error.

The increasingly greater number of people exposed to air emissions however ensures that even minor changes in relative risk will add up to significant public health issues. The advent of new forms of exposure and new risk factors, some of them such as endocrine disruptors with the potential to have lifetime consequences for wellbeing, also indicates that there is a continuing need

for both caution and intervention[2]. As the effects of human activity and problems of environmental protection become more global in scope and extent, the need to identify and to resolve the health threats associated with environmental contamination becomes ever more important[3][4].However, successful action requires an awareness not just of the nature of the problem, but also of the sources and underlying mechanisms, because only then will intervention be aimed to where it is most required and expected to have the greatest impact. Therefore, as a backdrop to the other chapters in this volume, this chapter explores the essence of the relation between pollution of the atmosphere and health and considers the contribution of pollution of the environment to the global burden of diseases.

RELATIONS BETWEEN HEALTH AND ENVIRONMENTAL POLLUTION

Environmental pollution may be defined clearly, if quite narrowly, as the presence of an agent in the environment that is potentially detrimental to either the environment or human health. Pollutants, as such, take multiple shapes. They contain not only chemicals, but also organisms, biological materials and, in their different forms, electricity (e.g. noise, heat, radiation). Therefore, the number of possible toxins is practically innumerable. There are, for instance, some 30,000 chemicals in general use today, any of which during manufacturing or use can be released into the atmosphere[5].In terms of their toxicity and health risks, less than 1 percent of these have been subject to a detailed evaluation. Truly unquantifiable is the number of biological contaminants. They contain not only live and viable cells, such as bacteria, but also a wide variety of endotoxins which can be produced after death from the protoplasm of organisms. There is, however, no lack of possible health threats to the environment. For the most part, what is missing is an awareness of the existence and processes of these threats.

The source–effect sequence

A dynamic and dependent mechanism is both the relation between pollution and health. Susceptible persons must obtain doses of the pollutant or its decomposition products necessary to cause detectable effects in order for toxins to have an effect on wellbeing. These people would have been exposed to the pollutant for this to occur, frequently over relatively lengthy periods of time or repeatedly. These exposures demand that exposed people and pollutants concurrently inhabit the same habitats[6]. The pollutants must not only be released into the environment in order for this to occur, but then dispersed through it in media used by, or accessible to, humans.

Except for contaminants that are intrinsically harmful, the health impacts of environmental emissions are therefore far from inevitable; they rely on the coincidence of both the mechanisms of emission and dispersion that dictate where and when the pollutant appears in the atmosphere and the human activities that decide where and when it occurs in those same areas[7]. The entire method, from source to effect, may simply be described as a causal chain. If this shows, the bulk of toxins are human in nature. They originate from human activities such as manufacturing,

development and use of electricity, transport, household activities, disposal of waste, agriculture and leisure.However, natural causes of emissions can also be important in certain circumstances. Examples include radon, emitted from the breakdown of radioactive compounds in the crust of the Earth, arsenic released by natural rock sources into ground waters, heavy metals accumulating in soils and sediments resulting from ore-bearing rocks, and particulates and sulphur dioxides produced from wildfires or volcanic activities. The release from these various channels takes place in a wide variety of forms and in a variety of environmental media, including the atmosphere, surface waters, soil and ground waters[8].Emission assessments by source and atmosphere are inevitably only estimated, since they are rarely clearly observable. Instead, most inventories of pollutants derive from some form of simulation, either based on emission factors for various processes or source activities5 or on input-output models, i.e. by measuring the difference between the quantity of material input into the process and the quantity in the finished product.

EMISSIONS TO GROUNDWATER, SURFACE WATER AND SOIL

Via a number of mechanisms, releases to other media, such as surface water, groundwater and soil, also occur. In terms of aqueous contaminants, intentional dumping, spillage, e.g. from storage, during shipping, or during production and use, leakage and drainage, e.g. of agricultural chemicals, are all significant[9]. For certain sectors, regulatory standards for discharges to waterways are set, aimed at maintaining levels of pollution under agreed limits. However, illegal discharges or accidental leaks often occur and accounted for the majority of recorded cases of surface water leakage in the UK in 2001, for which the source is known.Dumping is a significant cause of emission of solid waste, both lawfully at landfill sites and illegally, but final release into the broader atmosphere can occur only when these materials decompose or break up. As a result, landfill sites may be responsible for the emissions of a wide range of pollutants through various routes, especially when such sites are poorly sealed or maintained. The importance of casual and illicit dumping to the contamination of the atmosphere is, inevitably, little understood.

CONCLUSION

The complexities involved in the relationship between environmental pollution and health and the uncertainties inherent in the mortality and morbidity data available, existing knowledge of disease aetiology, and environmental information and exposure estimates all mean that any attempt to assess the environmental contribution to the global burden of disease is difficult to assess. Therefore, the estimates provided to date must be assumed to be no more than estimates of order-of-magnitude. Nevertheless, considering these limits, some assumptions appear beyond refutation.The first is that environmental pollution plays an important role in a variety of health outcomes, and this adds to a serious public health concern in several cases. In this respect, water pollution, sanitation and hygiene, indoor air pollution and, to a lesser extent, outdoor air pollution and exposure to chemicals are all important risk factors in both the indoor and outdoor

environment. In many instances, ionizing and non-ionizing radiation and noise are also reasons for concern. Secondly, it is clear that the distribution of risks from these factors worldwide is not equal.It may be difficult to quantify the global burden of disease, but there are stark contrasts in that burden between the developed world and the developing world, between rich and poor, and often between children and adults. The industrialized world is not risk-free, and with all public health ills, growth is no panacea. In fact, the reverse is true sometimes: trends such as increased dependency on road transport, increased use of chemicals in agriculture, and increased spending time in new, hermetically sealed buildings surrounded by chemically-based fabrics and furnishings will potentially increase exposure and intensify health risks.Overall, however, the developing world is much more severely affected by pollution, and is becoming more so in many instances, as development pressures add to traditional sources of exposure and risk. Thirdly, and perhaps most importantly, it is easy to avoid many of these risks and health effects. The solution rarely lies in sophisticated technologies or even costly drugs. Instead, the need for preventive action is first and foremost to reduce the emission of pollutants into the environment and is largely achievable with existing know-how. Indeed, it has already been implemented in many of the wealthier countries, in many cases.Therefore, science definitely has a role to play in answering these problems. More research on a range of emerging environmental health problems is undoubtedly required. But the lack of action that has allowed environmental pollution to continue to take its toll on health stems not so much from scientific or technological failures as from a lack of political will and economic empowerment. It is from that direction that salvation for those at the mercy of environmental pollution ultimately needs to come.

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