

### 1. Definition of pollution

**Pollution** is considered as one of the most serious problems that faces human societies especially in developing countries. Pollution, in its broad sense, is the presence or addition of any substance to the air, water, or soil in sufficient quantities that it has a deleterious effect on living organisms or impairs the use of the air, water, or soil for recreation, agriculture, industry or domestic purposes.

### 2. The source–effect chain

The link between pollution and health is both a complex and contingent process. For pollutants to have an effect on health, susceptible individuals must receive doses of the pollutant, or its decomposition products, sufficient to trigger detectable symptoms. For this to occur, these individuals must have been exposed to the pollutant, often over relatively long periods of time or on repeated occasions. Such exposures require that the susceptible individuals and pollutants shared the same environments at the same time. For this to happen, the pollutants must not only be released into the environment, but then be dispersed through it in media used by, or accessible to, humans. Health consequences of environmental pollution are thus far from inevitable, even for pollutants that are inherently toxic; they depend on the coincidence of both the emission and dispersion processes that determine where and when the pollutant occurs in the environment, and the human behaviors that determine where and when they occupy those same locations.

The whole process can simply be represented as a causal chain, from source to effect (Fig. 1).

### 3. Exposure and dose

While the potential for health impairment initially depends upon the existence and concentrations of pollutants in the environment, for health effects to occur exposures must take place that lead to a dose sufficient to have adverse health consequences. Exposure in this context is defined as the contact between a hazardous agent (in this case a pollutant) and an organism. Dose refers to the quantity of the substance in the body. The absorbed dose refers to the amount of the substance entering the body as a whole; target organ dose refers to the amount reaching the specific organs that are affected.

Exposure can take place in many different ways. Three main forms of exposure are generally recognized: dermal contact, inhalation and ingestion. In some cases, however, it may also be useful to recognize a fourth— injection—for example, when pollutants are transmitted by animal bites or by deliberate injection. In each of these cases, exposure may occur in a range of different environments.

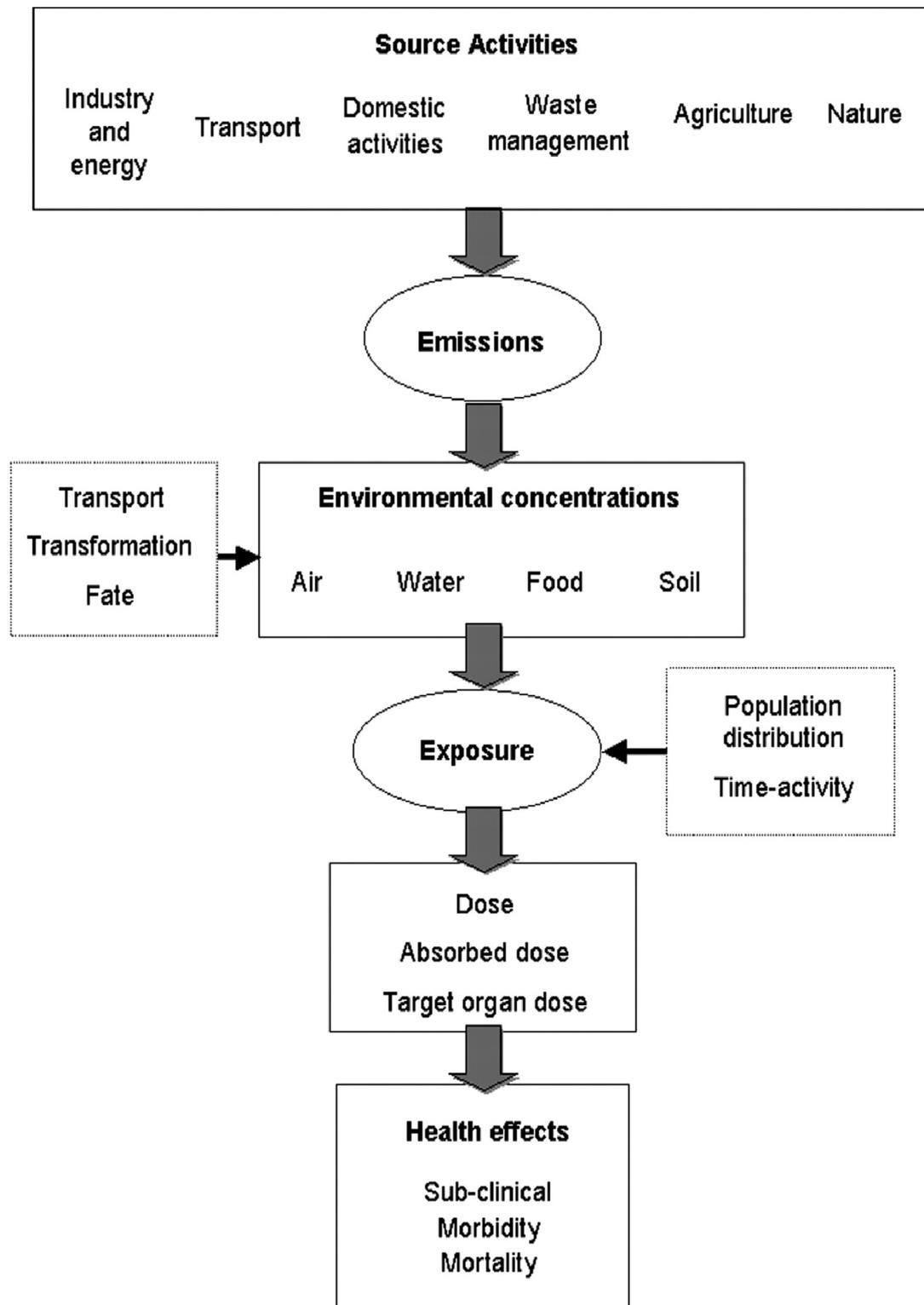


Fig 1: Sources and effects of pollutions  
 Source:<http://bmb.oxfordjournals.org/content/vol68/issue1/images/large/bmbull019.f1.jpeg>

Whilst some exposures occur in the outdoor (ambient) environment, most people spend the majority of their time indoors, either at home or at their place of work or learning. Indoor exposures therefore often make up a major proportion of total exposure—