THE HEALTH EFFECTS OF BREATHING THE AIR NEAR COAL MINES

Air pollution takes different forms. We can't see most of the things floating around in the air, but these things, called particulate matter (PM), can damage our health.

- PM10 particles measure between 2.5 and 10 micrometers (from 25 to 100 times thinner than a human hair). These coarse particles cause less severe health effects. They are often visible, and are caused by smoke, dirt and dust from factories, farming, roads and mining.
- Fine particles are up to 2.5 micrometers in size (100+ times thinner than a human hair). These particles are not visible, and are more dangerous to human health as they can contain toxic organic compounds and heavy metals. It is these finer particles that lodge deep in the lungs, and are the more dangerous particles resulting from open-cut coal mining. Particulates can also contain arsenic and dioxins, which produce oxidative radicals. In addition, machines using diesel fuel emit many toxic chemicals, including nitrogen dioxide, sulphur dioxide and formaldehyde, and the low-grade diesel used on mine sites contains far more sulphur than higher-grade diesel. The solvents in low-grade diesel can cause brain damage and any heavy metals or other contaminants cause cancers.

Most Australian air pollution monitors, however, only monitor for PM10 particles, so whilst there is plenty of anecdotal evidence, it is difficult to get scientific evidence here of the link between fine particulates and ill-health. Studies have been done, though, in many other countries which have more sophisticated air pollution monitoring systems, such as the UK and USA.

EFFECTS ON THE HEALTH OF INFANTS

These studies show that there is a relationship between infant deaths from respiratory causes and long-term exposure to fine particulate matter. In addition, babies born to mothers exposed to air pollution are more likely to have low birth weight and to be born prematurely, and these babies are more likely to have respiratory problems.

Some studies have shown that Sudden Infant Death Syndrome is associated with the presence of nitrogen dioxide and sulphur dioxide. These chemicals, together with formaldehyde, are emitted by machines using diesel fuel. Formaldehyde has caused tumours in laboratory rats. Diesel emissions are carcinogenic, and have been linked to heart attack and stroke in healthy men.

An American study showed that infants who are exposed to relatively higher levels of particulate matter over a period of weeks to months are more likely to develop bronchiolitis severe enough to warrant hospitalization, and a high proportion of these go on to develop chronic respiratory symptoms of recurrent wheezing and asthma.

Another American study shows an association between respiratory-related deaths of infants (between one month and one year old) and fine particle air pollution in California, adding to previous literature in the United States and in other countries that air pollution may be associated with some infant deaths.

EFFECTS ON THE HEALTH OF CHILDREN

Babies with respiratory problems often develop asthma as children. Dr Dick van Steenis recently visited Australia from the UK. His studies, and others, showed that both PM1 and PM2.5 particulates produced by open-cut coal mines also cause new cases of asthma to develop in children, especially if toxic waste is present due to known or unknown tipping,

He confirmed a rise in asthma to affect 33% of primary school children living within one mile of an open-cut coal mine, a cumulative rise to 21 % at two miles and even up to 12% at three miles.

Particle analysis done in the UK show that asthma is caused by

cut quartz particles less than PM1 in size, which are "second to asbestos in terms of serious effects on the lungs. The body has to wall off these particles, causing fibrosis, which was called silicosis in underground miners, but which equally applies above ground".

coal particles less than PM1, which cause inflammation. Human white blood cells can only ingest a certain amount of PM 1 2.5 particulates - the rest are walled off, causing chronic pulmonary obstructive disease and fibrosis.

Dr van Steenis states that the alleged ability to control dust by open-cut mining companies is a fallacy. The PM2.5 and PM1 dust cannot be controlled. The lightness of fine particles allows them to remain suspended for long periods, and to blow hundreds of kilometres.

Australian Dr Pauline Roberts is concerned about the effect of heavy metal exposure through inhalation of particulate matter on children's growth and behaviour. High lead levels, for example, have been linked to a reduction in IQ, negative classroom behaviour, juvenile delinquency and increased violent behaviour.

EFFECTS ON THE HEALTH OF ADULTS

Long-term exposure to air pollution from coal mining leads to increasingly serious lung diseases, such as chronic pulmonary obstructive disease, fibrosis and lung cancer. There will also be increased incidence of heart attacks, generalised premature deaths, strokes, type 2 diabetes, clinical depression and other conditions resulting from any toxic waste contaminating the site, for example cancers, hormone disorders, birth defects, skin rashes, eye inflammation, and nausea, due to pollutants such as organic compounds, heavy metals, dioxins and even radio-active matter.

In a study of coalmining communities in West Virginia, Michael Hendryx found that high levels of coal production were associated with higher rates of cardiopulmonary disease, chronic obstructive pulmonary disease, hypertension, lung disease, and kidney disease.

The Hunter Valley Research Foundation's 2008-2009 report into Newcastle and the Hunter Valley reveals "an increased mortality; decreased life expectancy; increased rates of lung, skin and colorectal cancer; and increased rates of death from breast, cervical and prostate cancer when compared to the rest of NSW in general."

And yet the NSW government last year quashed a motion calling for a comprehensive population health study to assess the impact of the coal and power industries in the Hunter.

An American study showed that 55% of open-cut coal mine workers had developed lung damage by twenty years of age. In the USA and the UK, governments are paying massive amounts in compensation for lung damage caused by their failure to exercise duty of care in relation to the health of the population.

This should be a lesson for our governments.

Europe has a Human Rights Convention which can be used by people whose health is threatened by proposed harmful activities. We Australians have no such safety net. Our governments have changed the laws, with impunity, to give more and more power to mining companies to disrupt the lives and health of our communities. But we have elections in this country - not all parties are hell-bent on expanding a destructive and unsustainable coal industry, and not all parties are prepared to remove the rights of citizens to lead a full and healthy life.

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