

Depleted ozone level linked to skin cancer

The past year has been full of news of the 'ozone hole' over Antarctica.

Is this an immediate danger?

Are Illawarra beachgoers risking skin cancer because of increased ultraviolet radiation?

Actually, there is little extra risk now. The ozone hole is a symptom of a longer term problem.

Ozone is a highly reactive gas, similar to the oxygen we breathe but with three oxygen atoms instead of two.

The intense solar radiation in the upper atmosphere causes the formation of ozone, especially in the altitude range 15 to 40 kilometres.

Although ozone is one of the nasty components of smog at the earth's surface, it is beneficial in the upper atmosphere.

It absorbs ultraviolet light which would otherwise penetrate to the earth's surface.

When ozone levels are depleted, more ultraviolet light gets through. Exposure to ultraviolet at certain wavelengths is thought to be a major factor in causing skin cancer.

Skin cancer is a big problem in Australia, since most of the country is relatively close to the equator, giving significant ultraviolet exposure, and most of the people have susceptible light skins.

Queensland has the highest rate of skin cancer in the world.

Therefore the ozone hole should be of special interest to Australians.

In spite of the phrase 'ozone hole', there is still ozone over Antarctica.

It is just that the amount is reduced from the usual seasonal value.

The reduction in ozone occurs too far south to have much impact on ultraviolet exposures over Australia — so far.

There are many human activities which can affect ozone in the upper atmosphere, including atmospheric nuclear explosions, high flying jets such as Concorde, and even use of certain fertilisers.

The cause of the Antarctic ozone hole is thought to be the use of fluorocarbons, commonly used in aerosol spray cans and as refrigerants.

The fluorocarbons are inert, which is why they are safe in sprays.

But they are so inert that they float around for years or decades without being destroyed — until they drift into the upper atmosphere.

There, they are broken down by intense solar radiation. The resulting compounds are potent catalysts, which continue to eat away at ozone.

The ozone hole is the first strong empirical evidence for the theory that fluorocarbons lead to ozone destruction.

Briefings

BEHIND THE NEWS ANALYSIS

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Briefings can be heard weekly on 1430 Radio 2WN every Friday between 10.30 and 11 am.

Governments had taken notice of the theory earlier, and international efforts have been made to cut back on fluorocarbon production.

That's the reason why many of the sprays you find in shops now use hydrocarbon propellants. Reducing the use of fluorocarbons as refrigerants will be more difficult. When old fridges are dumped, the fluorocarbons eventually leak out.

Many years later, ozone is reduced a bit more.

Furthermore, many manufacturers have been reluctant to cut back on fluorocarbon production and use unless forced.

They pay little of the penalty for using fluorocarbons, while reaping the profits. This is why government regulation has been necessary.

Even if all fluorocarbon production stopped today, the effect on ozone will continue increasing for many years, as fluorocarbons already in the lower atmosphere gradually make its way skyward.

The fluorocarbon-ozone story has a lesson.

Even in what seems to be a purely beneficial use of technology — fluorocarbons — there may be hidden dangers.

The lesson is to be cautious and not rush to adopt the latest technology just because it is the latest. There is a need for careful examination of environmental and social impacts. There is also a need for citizen concern.

Without the environmental movement to apply pressure, the warnings about fluorocarbons might easily have been ignored.

Just to be safe, use a roll-on.