

# Public health, asbestos cement roofs and the Free State audit

**B Gibson<sup>1</sup>, JM teWaterNaude<sup>2</sup>, D Rees<sup>3</sup>**

<sup>1</sup> Issue management consultant on asbestos-related matters; Chairman: Kgalagadi Relief Trust

<sup>2</sup> Public health medicine specialist: School of Public Health and Family Medicine, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa; Diagnostic Medicine, Claremont, Cape Town, South Africa

<sup>3</sup> Occupational medicine specialist; professor emeritus: School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

**Correspondence:** Dr Jim teWaterNaude, 205 Library Square, Wilderness Road, Claremont, Cape Town, 7708, South Africa  
e-mail: doc@drjim.co.za

Prof. Emeritus D Rees and Dr JM teWaterNaude are members of SASOM

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The furore over the controversial Free State 'asbestos audit', where more than R200 million of the R230 million contract fee appears to have been misspent or misappropriated, has been a mixed blessing for public health.

The investigation into state capture by the public protector<sup>1</sup> and the Zondo Commission<sup>2</sup> has heightened public fears about asbestos in general, which is positive. But the media coverage has also created unnecessary fear about the possible health impacts of asbestos cement (AC) roofs in situ. For example, the 4 Oct 2020 *Sunday Times* front page headline read, "We can't breathe".<sup>3</sup>

There is minimal evidence of the pathogenicity of AC roof sheets in place on dwellings.<sup>4</sup> While it is possible to contract pleural plaques (typically inert) and mesothelioma (a fatal disease) from exposure to relatively low levels of respirable asbestos fibres,<sup>5</sup> and we cannot dismiss the potential risk of mesothelioma from this source, the numbers, if they occur, will be small; uncontested evidence of disease occurrence has not yet been published.

The manufacture and sale of asbestos-containing materials was banned in South Africa in 2008.<sup>6</sup> Many hundreds of thousands of homes, factories, offices, and other buildings have AC roofs and other building materials containing asbestos, that remain legal.

Asbestos cement roof sheets were manufactured in South Africa from early in the last century until 2002, when asbestos was replaced as the reinforcing fibre by both organic and inorganic alternative fibres.<sup>7</sup> Asbestos cement roof sheets contain approximately 70% cement, 20% water and 10% asbestos (a mix of crocidolite, amosite and chrysotile until about 1985; and only chrysotile thereafter).<sup>8</sup> During typical use, asbestos fibres stay bound in the high-density cement matrix of the roof sheet.

Weathering can release relatively few fibres from AC roofing sheets, but the amount is probably insufficient to represent a significant exposure risk. The measurement of low levels of respirable asbestos fibre in residential areas is complex, and few studies have focused on fibre release from AC roofs. A study for the Botswana Housing Corporation of five suburbs with predominantly AC roofs

showed low levels of environmental asbestos – well below a level that would be considered a risk to human health.<sup>9</sup>

Ferrante et al. (2015) reported an increased risk (odds ratio) of mesothelioma of 2.4 (95% CI 1.4–4.2) in participants living in dwellings with asbestos roofs, compared to those living in dwellings without them (importantly, exclusively in people with no report of occupational asbestos exposure.)<sup>10</sup> Potential methodological sources of bias in this study have been suggested.<sup>11</sup> However, the magnitude and the direction of the potential biases impacting on the study's findings are uncertain, and Ferrante and co-authors rebutted some of these assertions.<sup>12</sup>

There have been two systematic reviews of the literature on non-occupational asbestos exposure and mesothelioma.<sup>4,13</sup> Neither identified studies dealing exclusively with mere residence in a home with asbestos construction materials as a risk for cancer. However, this could be because of the paucity of studies on this issue. The second systematic review<sup>13</sup> considered the Ferrante study but did not have a category to specifically analyse the risks of mesothelioma where AC materials in a home were present.

Researchers at the National Institute for Occupational Health (NIOH) in South Africa conducted two studies on asbestos fibres in Soweto, where AC roofs predominate:

- 'Asbestos in and around Soweto dwellings with asbestos cement roofs', published in 2007, concluded that "There appears to be no significant exposure to asbestos in and around houses in Soweto with asbestos cement roofs", but that "caution is advised when carrying out repairs or renovations on the roofs or using the material for other purposes",<sup>14</sup> and
- 'Asbestos in soils around dwellings in Soweto', published in 2009, found that the soil below the rainwater runoff line of asbestos cement roofs at 61 houses in Soweto contained 0.01% to 0.1% asbestos fibres by weight. The report concluded that "The absence of asbestos fibres in the air in Soweto suggests that the asbestos in soils from below roofs does not pose a hazard to residents" (but that) "caution should be exercised when gardening or excavating around dwelling with asbestos cement roofs."<sup>15</sup>

Simply put, it is unlikely that undamaged and undisturbed AC roof sheets will affect the health of occupants.

The 1998 National Asbestos Summit, convened by government, business and labour, submitted an impressive declaration, recommendations and an action plan to the Cabinet of South Africa to deal with South Africa's asbestos legacy.<sup>16</sup> The replacement of AC building materials was not deemed a priority.

In a national policy vacuum, current projects to identify, remove and replace AC roofs are misguided. Public concern and scarce resources should rather be focused on the risk faced by thousands of residents in former asbestos mining areas where high levels of environmental pollution will impact the health of generations to come. The risk to health in such areas is far greater than that from exposure to AC products.<sup>17</sup> In addition, there are numerous other critical public health needs facing South Africans that deserve more attention, including food security, clean water and sanitation services, reliable energy, and control of communicable diseases.

In any event, the cost of replacing AC roofs in South Africa is well beyond the current financial capacity of the State. In 2001, the (then) Department of Housing was advised that the cost of re-roofing a 30 m<sup>2</sup> low-cost home with an AC roof would be, on average, R3 250.<sup>18</sup> The current costs associated with the safe removal and replacement of an AC roof with asbestos-free fibre-cement sheets would be approximately R10 500 for a 30 m<sup>2</sup> housing unit (Craig Cronje, Everite, personal communication, 17 January 2021). The disposal cost of tonnes of discarded AC roofs will be exacerbated by costs of transport to remote hazardous waste sites.

We are not aware of an accurate audit of the number of homes fitted with AC roof sheets in South Africa, but the number will certainly exceed hundreds of thousands. South Africans will continue to live with the legacy of AC roofing for many decades to come. This brings into sharp focus the challenges of safe maintenance. The risk of mesothelioma due to exposure to asbestos during home renovation is of increasing concern in Western Australia.<sup>19</sup> This underlines the urgent need for campaigns to promote the safe handling of domestic asbestos-containing materials. High numbers of respirable asbestos fibres are released by aggressive work practices, such as cutting, sanding and cleaning a roof with a high-pressure water jet. Using force and power tools on asbestos cement is extremely dangerous. These activities are prohibited or strictly controlled by the recent South African Asbestos Abatement Regulations of 2020,<sup>20</sup> but the regulations only apply to the control of the asbestos risk in the workplace. There is no control over the do-it-yourself (DIY) activities of occupants of houses with AC roofs. An Australian study ('Cresting the third wave') sets out the risk of mesothelioma from DIY activities on asbestos-containing products.<sup>21</sup>

Guidelines to assist people to safely manage asbestos cement construction materials in their homes have been developed, for example, by the UK Newham Council.<sup>22</sup> In Western Australia, homeowners have access to a smart phone application that helps them to assess the risk of AC building materials and provides guidance on what to do if the materials are in poor condition. Options include coating or removal.<sup>23</sup>

The generally accepted lifespan of AC roof sheets is about 50 years.<sup>24</sup> Many sheets currently in use are much older, and thousands, if not millions, of AC roof sheets will have to be removed from homes, factories and public buildings at some point when

they are no longer functional. The cost and complexity of the removal programme will present all levels of government with extraordinary challenges.

## Recommendations

1. The introduction of a mesothelioma register that includes a detailed asbestos exposure history of all cases reported. Although there is no South African evidence that anybody has developed an asbestos-related disease because they lived in a house with an AC roof, more research and documentation is needed.
2. The development, by the Department of Human Settlements, of a sober and sensible public information and behaviour change campaign about the relative health risks of exposure to asbestos fibres, whether they are in former mining areas, occupational settings, or residential areas. A balanced message is key. We must not create unnecessary anxiety for occupants who are powerless to take appropriate action. It would be more productive to reassure people about the safety of these roofs but also urge and support them to take appropriate precautions or employ suitably trained contractors when they remove or work with these materials. Few homeowners can, however, afford to employ asbestos abatement specialists for a simple roof repair or building extension.
3. The development of a methodology and support system to help residents identify AC roof sheets and other AC building materials, such as downpipes or ceiling boards, and to assess their condition and potential to release dangerous levels of asbestos fibres (i.e. extensive damage). This should be compiled by either the Department of Human Settlements or the Department of Environment, Forestry and Fisheries, and made widely available. The methodology should include guidance on DIY maintenance of AC products (e.g. coating) or removal, if necessary. In our experience, a major challenge facing homeowners is the safe and legal disposal of small amounts of AC waste, e.g. a broken roof sheet, downpipe or plant container. Approved waste sites operate on an industrial scale and are difficult for the average homeowner to access. Affordable disposal facilities should be made available at a local level.
4. The development, by the State, of a long-term AC roof removal/replacement plan, based on close consultation with occupational, environmental and public health specialists. We were pleased to learn, at the time of writing this opinion piece, that the Land Remediation Section in the Department of Environment, Forestry and Fisheries was active in developing a National Asbestos Management Strategy.<sup>25</sup>
5. A comprehensive review of South Africa's asbestos priorities, including contamination of mining areas, schools with asbestos cement construction materials, and dwellings with AC roofs.

- *Brian Gibson is chairman of the Kgalagadi Relief Trust, which provides additional compensation to former asbestos mine workers and environmentally-exposed persons with asbestos-related diseases. He has consulted to former asbestos cement buildings products manufacturer, Everite Limited, on the 'Asbestos & Health' issue for 39 years.*

*e-mail: gibson@icon.co.za*

- *Jim teWaterNaud is a public health medicine specialist who runs a public interest, academically-inclined medical firm, focusing on dust diseases.*  
e-mail: doc@drjim.co.za
- *David Rees is a professor emeritus at the School of Public Health, University of the Witwatersrand, Johannesburg; and an occupational medicine specialist who was awarded a PhD for his research on mesothelioma, and who has attended to cases of asbestos-related disease for decades.*  
e-mail: profdavidjrees@gmail.com

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