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Awareness and Profiling of High-Risk Asbestos Exposure Groups in Australia

Katrina Khamhing *, Shane McArdle and Justine Ross

Australian Government Asbestos Safety and Eradication Agency, Surry Hills, Sydney, NSW 2010, Australia
* Correspondence: katrina.khamhing@asbestossafety.gov.au; Tel.: +61-1300-326-148

Abstract: The increase in home improvement activity during the COVID-19 pandemic gave rise to concerns of increased asbestos exposure risk. This paper describes high-risk asbestos exposure groups based on current home improvement trends in Australia. A series of quantitative and qualitative studies were commissioned to better understand the attitudes, motivations, and behaviours of home improvers in Australia. In 2021, two in three Australian adults were inclined to undertake home improvement projects—big or small—with or without professional help, underscoring the importance of improving the asbestos safety knowledge and capacity of this cohort. The studies commissioned across 2020 and 2021 provide a deep analysis into this cohort, defining who they are and the segments that make up home improvers, their behaviours, and their asbestos awareness and attitudes. This knowledge enables the development and implementation of a range of targeted campaigns to increase asbestos awareness and prevent potential exposure to asbestos fibres.

Keywords: asbestos; asbestos-containing materials (ACMs); home improvers; do-it-yourself (DIY)

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1. Introduction

The management and regulation of asbestos in Australia involves multiple policy areas, i.e., public health, workplace safety, environmental protection, border protection, consumer safety, and urban planning. It is also spread across three tiers of government at the local, state or territory, and the federal level. Consequently, there are numerous government agencies involved in asbestos management and regulation, and their functions often overlap.

In 2012, the Asbestos Management Review identified that the management of asbestos across multiple jurisdictions was fragmented and inconsistent. The review found that urgent, systematic, nationwide action was needed to deal with Australia's asbestos legacy and that a national strategic plan would be an appropriate tool to focus and coordinate asbestos-related actions across Australia [1]. The Asbestos Management Review made recommendations on key elements of a national strategic plan and the establishment of a new national agency to administer it. The Asbestos Safety and Eradication Agency (ASEA) was subsequently established in 2013 [2] to administer the *National Strategic Plan for Asbestos Awareness and Management* (Asbestos National Strategic Plan) [3,4]. The Asbestos National Strategic Plan, of which there have been two phases to date [3,4] ensures there is a nationally consistent and coordinated approach to asbestos awareness, management, and removal in Australia.

1.1. Asbestos National Strategic Plan

The aim of the Asbestos National Strategic Plan is to prevent exposure to asbestos fibres in order to eliminate asbestos-related diseases (ARDs) in Australia. To achieve this, the current 2019–2023 phase of the plan includes four national priority areas and nine national targets. The first national priority is to improve asbestos awareness to influence behavioural change. Its related target measures the level of awareness and knowledge

of the health risks of asbestos-containing materials (ACMs), and where to source trusted information [4].

There are five cohorts, or populations of interest, which are the focus of target 1:

- Cohort 1: Tradespersons;
- Cohort 2: Property managers;
- Cohort 3: Owners and tenants;
- Cohort 4: Real estate agents;
- Cohort 5: People working in buildings with asbestos.

For cohort 3, the focus of the research described herein, the target is 'increased awareness of the health risks of ACMs and where to source information among 80% of homeowners and occupiers' [4]. To establish the level of asbestos awareness and attitudes in this cohort, and to identify appropriate opportunities for awareness campaigns to improve awareness, both quantitative and qualitative studies are conducted periodically [5–10].

1.2. COVID-19 Pandemic

In 2020 and 2021, in the wake of concerns that the COVID-19 pandemic was fueling an increase in home improvement activities in Australia, ASEA commissioned a series of quantitative and qualitative studies of cohort 3 [8–10] as part of its legislated research remit to understand the public health risk this situation was creating. Since the banning of all forms of asbestos in Australia in 2003, low-level exposure to asbestos in the home has been an increasing concern. Home maintenance and renovation involving asbestos-containing materials is one of the activities most frequently associated with this concern [11–17]. The peak period of use of asbestos-containing building materials was from the mid-1940s until the late 1980s [18]. Many homes in Australia built before 1990 contain asbestos.

Previous quantitative and qualitative surveys [5–10] have confirmed that although there is good awareness among home occupiers that asbestos can be dangerous, e.g., asbestos causes cancer, there are low levels of awareness regarding how and when ACMs present a risk, where ACMs can be found in homes, and a lack of confidence in knowing the appropriate precautions and how to manage ACMs if found, particularly around disposal. In the most recent progress reporting against the awareness target, it shows awareness about the dangers of asbestos to health has been achieved, and there are improving levels of awareness that many homes built before 1990 contain asbestos. However, there is low awareness of simple ways to stay safe, including engagement of asbestos professionals and proper disposal methods [19] (see also Figure 1).

Figure 1. Asbestos awareness levels of homeowners and occupiers [19].

Other studies have also found evidence of a gap between knowledge and attitudes towards asbestos and safe and lawful behaviour, with what people know or intend not always being a reliable indicator of their actions [20].

1.3. Research Objectives

The aim of the research described in this paper was twofold:

- To gain a more nuanced understanding of different home improvers in cohort 3 by identifying segments of similar people;
- To evaluate asbestos knowledge, attitudes, and behaviors of each segment.

This will help to target and prioritise future communication and engagement activities from those most to least at risk. The World Health Organisation (WHO) says there is no known safe level of exposure to asbestos [21]. In addition, although there is debate about the risks associated with low level exposure, there is consensus that all exposures should and can be avoided [22–24].

2. Methodology

To achieve the research objectives, a mixed method approach of a quantitative study [8] followed by a qualitative study [10] was undertaken.

The quantitative study was used to reach a larger sample size to ensure robustness of results and to obtain baseline knowledge, attitudes, and behaviours of home improvers, including the identification of home improver segments. This included a nationally representative online survey of 1506 participants who have completed one or more home improvement projects; are currently working on one or more home improvement project/s; and/or are planning to undertake one or more home improvement project/s [8]. A formal statistical segmentation was also developed using Latent Class Analysis. This entailed a statistical procedure used to qualitatively identify different subgroups within populations who often share certain outward characteristics [25].

The follow-up qualitative study was essential to extend the understanding of the quantitative findings, offering exploratory research into their demographics, motivations, sources of influence, planning process, and beliefs and behaviours relating to asbestos for each segment. The qualitative study included a mix of interviews and focus groups. Interviews were used to give participants time to deeply reflect and fully express their experiences without being biased by other participants. Focus groups were used as an effective method to understand motivations and attitudes of the segments and explore the themes discovered in the interviews [10].

3. Results: Quantitative Research

The target audience of past national surveys in Australia has been 'DIYers' who undertake the activity of decorating, building, or making repairs at home by oneself rather than paying for someone else to do the work. For this study, the term 'DIYer' was expanded to include anyone undertaking home improvement projects from small maintenance or improvements to large renovations—including those who outsource all or some of the project (home improvers) [8].

In the quantitative awareness survey conducted in 2020, 57% of Australians were 'DIYers' [9]. In 2021, out of 1506 respondents across Australia, 67% considered themselves 'home improvers', split evenly between do-it-yourself renovators (DIYers; 51% of home improvers) and those who outsource most or all of the renovation (49% of home improvers) [8].

Through the use of Latent Class Analysis to perform the statistical segmentation, the 2021 study yielded five distinct segments based on clustering of similar demographic, socioeconomic, behavioural, and attitudinal traits. These segments are outlined in Figure 2, in order of least to most at risk of asbestos exposure based on their levels of awareness and knowledge, with percentages indicating their share of all home improvers based on the 2021 study.

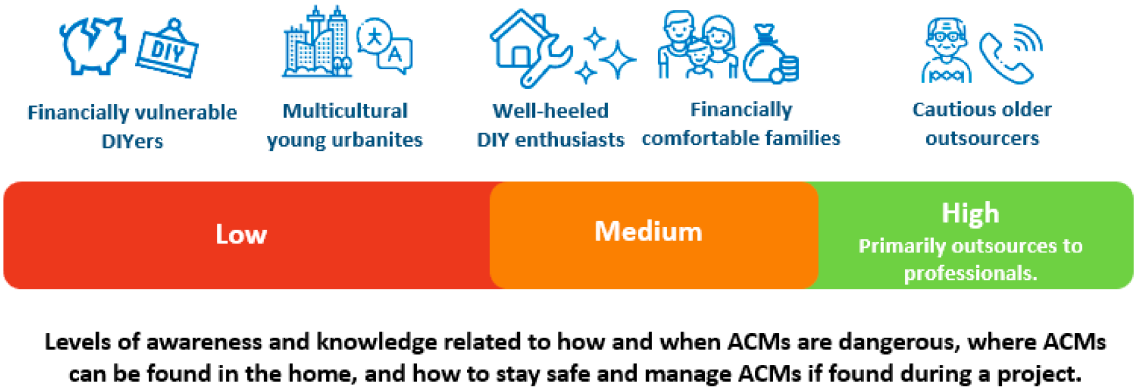

Figure 2. Asbestos awareness and knowledge amongst home improver segments as identified in the 2021 Asbestos Safety Home Improvement Research—Quantitative survey [8].

3.1. Financially Vulnerable DIYers

Financially vulnerable DIYers are perceived to be the most at risk of all the segments. The 2021 quantitative study findings indicated they were more likely to consider it less important to know about asbestos and were less likely to agree that asbestos can cause harm. Coupling this with their tendency to engage in DIY projects likely as a budget measure, they have an increased risk of exposure to ACMs, with little knowledge on how to keep safe and to help identify if ACMs are present prior to engaging in a project [8].

This segment understands the health risks associated with exposure to asbestos fibres but were not confident in what they knew in terms of whether the effects were immediate or not. They particularly struggled to outline the characteristics of ACMs and identify how and when ACMs present a risk [8].

3.2. Multicultural Young Urbanites

Multicultural young urbanites have similar traits to financially vulnerable DIYers, but their distinct characteristic is their multicultural background and cultural and linguistic diversity. They may also experience some financial vulnerability but tend to be more educated and better paid than those in the financially vulnerable DIYers segment.

Their approach to home improvement projects is largely focused on engaging friends and family to help, but they are no more or less likely to engage in DIY specific projects overall. The concern for this segment stems mostly from them feeling the least knowledgeable about asbestos, with some stating that they had never heard of asbestos before or feel they did not know anything about it [8].

3.3. Well-Heeled DIY Enthusiasts

This segment has a strong affinity for home improvement—specifically undertaking DIY projects as a hobby, working across a variety of project types [8]. They sit in the middle in terms of most at risk. This is based on their higher levels of awareness and knowledge than the first two segments, and their constant engagement in projects themselves, without professional help. This segment is at a higher risk of exposure to asbestos fibres, particularly if they undertake projects without knowing where ACMs might be present and without the appropriate precautions in place.

Most participants of the 2021 home improvement studies that fit into this segment indicated they understood the health risks, when and how ACMs present a risk, and characteristics relating to asbestos. Their understanding is from hearing about asbestos on the news and previous experience renovating properties where ACMs have been present.

3.4. Financially Comfortable Families

This segment includes middle aged 35–54 year-old people who are most likely to still have children living at home, are the least financially vulnerable, and have an even

preference for engaging in both DIY home improvement projects and outsourcing some or all of the project to professionals, working across all project types [8]. Of all the segments, they are one of the least at risk as they have higher levels of awareness and knowledge, are more likely to have contacted a licensed asbestos specialist for a previous project, and individuals within this segment were more likely to report having asbestos training or qualifications [8].

This segment is almost identical to the well-heeled DIY enthusiasts, with their higher levels of income and equal preference for DIY and outsourcing as the two key points of difference between the two segments. The common traits this segment shares with the well-heeled DIY enthusiasts are their understanding of the health risks, when and how ACMs present a risk, and characteristics relating to asbestos.

They also gained their awareness and knowledge from hearing about it on the news and previous experience renovating properties where ACMs were present.

3.5. Cautious Older Outsourcers

This segment is older than the other segments (aged 55+ years), likely retired, and living in regional or rural areas with all children having left home. They are financially comfortable and have a strong preference to outsource large and small projects to professionals [8].

This segment was reported to be more knowledgeable about asbestos and its dangers compared to the other segments. They are perceived as the least at risk segment because of their higher awareness and knowledge levels, and they engage in very little home improvement projects themselves, engaging professionals to complete most or all of the project. However, gaps still exist in their ability to both identify and manage ACMs.

3.6. Gaps in Knowledge

It is evident that, across the segments, the main areas where knowledge gaps exist amongst home improvers are related to how and when ACMs are dangerous, where ACMs can be found in the home, a lack of confidence in knowing the appropriate precautions, and how to manage ACMs if found during a project, particularly around disposal.

In 2021, only 6% of home improvers spontaneously mentioned asbestos as a potential risk when planning a home improvement project. The financially vulnerable DIYers and multicultural young urbanites were less likely to feel that it is important to know about managing asbestos in projects, whereas the cautious older outsourcers were more likely to think this is important [8].

Across the cohort, only two thirds of participants (at most) correctly identified each potential source of asbestos when prompted with a list—while 40% picked at least one incorrect source [8]. When respondents were unprompted, mentions of where asbestos may be located in the home were general, stating common areas such as walls, roofs, ceilings, older homes, and outbuildings [8].

Additionally, the 2021 study revealed that at least 28% of home improvers who have encountered asbestos admitted to inappropriate disposal methods, with the multicultural young urbanites more likely than all the segments to have used inappropriate disposal methods, and cautious older outsourcers were more likely to suggest appropriate methods.

4. Results: Qualitative Research

To gain a deeper understanding of the segments identified in the 2021 quantitative study, a follow up qualitative study using interviews and focus groups gauged if there were demographic differences which impacted attitude and behaviours towards asbestos safety [10].

The same demographic data and definition of the segments used in the quantitative study were adopted for the qualitative study to seek participants. However, there is a slight difference in how these segments are referred to in the qualitative study.

In this study, comfortable urban families captured both the well-heeled DIY enthusiasts and financially comfortable families segments identified in the quantitative study. Culturally and Linguistically Diverse Home Improvers referred to the multicultural young urbanites in the quantitative study, and financially vulnerable home improvers referred to the financially vulnerable DIYers segment.

Another point of difference to note in the segmentation of the qualitative study is the exclusion of the cautious older outsourcers segment. This segment was excluded to prioritise the more at risk segments with lower awareness and who were less likely to engage professionals to assist with their home improvement projects.

The 2021 qualitative study mapped the common behavioural biases and tactics that home improvers showed during each stage of their home improvement project journey outlined below.

Behavioural biases, emotional or cognitive, relate to our irrational beliefs or behaviours that can unconsciously influence our decision-making process [10]. Behavioural tactics are based on social psychology principals and are key components in understanding how to create meaningful social and behavioural change [10]. By layering these principals with the process that home improvers follow, it gave a unique insight into when the home improver is most likely to positively engage with messaging to create behavioural change [10].

Although messaging, format, and delivery needs to be targeted to the segment/s, this mapping exercise highlighted the opportunities for common behavioural change tactics that can be used across the cohort to create meaningful engagement. Ideally, these tactics would influence home improvers' unconscious behaviours and encourage them to adopt positive behavioural changes in their approach and attitudes towards asbestos [10].

4.1. Project Idea

During the project idea stage, the action and anchoring biases are present. Home improvers are motivated to act to their benefit and are heavily reliant on the first piece of information they receive [10]. This presents the opportunity to target home improvers with asbestos awareness messaging that encourages them to engage a professional, find out whether asbestos is present in their home, or consider proactive strategies for removal. It also presents the opportunity to consider asbestos as an important contingency that should be budgeted for when planning a project.

The earlier the communications reach all segments, the more opportunity they have to plan and prepare. This is in comparison to finding it at later stages of the project, risking potential exposure to harmful asbestos fibres, and engaging in improper disposal. Those distributing communications need to consider that each segment has a preferred information source. Some of the common communication strategies identified in the study included targeted online advertisements on websites that home improvers use for research, and areas where they buy project materials such as major hardware stores.

4.2. Planning and Research Stage

During the planning and research stage, self-efficiency and lag effect behavioural biases and tactics are commonly observed. Self-efficiency relates to a person's confidence that they can master a behaviour or goal. For example, a home improver is confident they will be able to learn a skill for the project to be completed [10]. This can be due to the prevalence of easy-to-follow how-to online videos—a key source of information for most home improvers, which also encourages their self-efficiency. Following on from the messaging that can be used in the project ideas stage, there is an opportunity to reinforce these messages during the planning and research stage—specifically, messaging that reminds home improvers that asbestos is something that should be managed by a professional.

Lag effect involves the spacing out of information which makes us more likely to remember it. Using an omni-channel campaign can be effective at this stage of the project as there is an opportunity to target home improvers with messaging as they go through the

process. For example, targeting them with messages on websites and online videos as they conduct research or when they go in store to buy project materials.

4.3. Project Commencement

During the project commencement stage, several behavioural biases are present, including social norms—beliefs that are collectively held about appropriate behaviours around asbestos—and status quo bias—a preference for how things are and a resistance to change. At this stage, the framing effect and endowment effect are two behavioural tactics that can be used to influence behavioural change in response to these pre-existing behavioural biases.

The framing effect is where decisions are influenced by how messaging is framed. Messaging should be presented in a way that will achieve engagement and prompt action. For example, messaging can encourage home improvers to think twice about asbestos before progressing their project. This can be in the form of 1-2-3 steps they can follow to be safe or framing asbestos as something they might come across in the project and is a contingency that should be budgeted for.

Accompanying this messaging with key facts about the financial or health risks, or damage that may occur to themselves, their family, friends, or home, aligns with the endowment effect—we value things more when they belong to us. When shown the statement 'asbestos causes cancer', participants in the qualitative study indicated that they were impacted by this statement as it highlights the severity of the risk of being exposed to asbestos [10]. Participants across the home improver segments agreed that this is a clear and concise statement that directly impacts them and would prompt them to consider the appropriate precautions and behaviours to keep themselves, their family, and friends safe.

4.4. Project in Progress

During the project in progress stage, decision fatigue and salience bias are present. Decision fatigue occurs when decision making gets worse when cognitive abilities get worn out. A key example of this discovered in the research is decision fatigue relating to the approach to safety. Although there is stronger cut-through of messaging in the earlier stages of the project, there is an opportunity here for safety messages to trigger home improvers and bring this front of mind.

Using the behavioural tactic of salience bias, we focus on information that is more noteworthy and ignore the rest. Here, there is an opportunity to promote safety messages as noteworthy information, reminding home improvers of the consequences they might encounter if they are not safe around asbestos.

4.5. Project Completion

Once home improvers reach completion of the project, their behavioural bias is in line with the ostrich effect—the avoidance of issues that we might have to face head on. In this context, this is common when home improvers encounter asbestos during their project and do not want to deal with the costs associated with removal and disposal. The consequence of this behavioural bias is the convenience of engaging in improper removal and disposal of ACMs.

Towards the end of a project, there is less opportunity for behavioural change tactics to be effective. Messaging around engaging a professional and the safe and legal disposal of asbestos needs to be presented to home improvers earlier in their journey—either in the project idea or planning and research stage.

5. Discussion: Learnings from the Quantitative and Qualitative Research

The findings from the quantitative and qualitative 2021 Asbestos Safety and Home Improvement Research [8,10] have provided key information to help address the challenge of developing and prioritising effective awareness campaigns to influence behavioural change within this high-risk cohort. The studies identify where the significant gaps in

knowledge exist, the type of information required to fill these gaps, and the format and platforms the segments prefer to assist with the cut-through of messaging. This understanding enables those in the asbestos management system to work together to deliver effective awareness campaigns and work towards priority one of the Asbestos National Strategic Plan [4]. The quantitative and qualitative studies reveal consistent findings on where knowledge is strong and where significant gaps exist. Progress against target one is demonstrated here, as the findings indicate home improvers are aware of the health risks (80% of respondents) and where to source information [4].

Based on this, awareness campaigns need to focus on achieving increased knowledge of the characteristics of ACMs and where it might be located in the home, how to keep safe, contacting a professional before starting any work, and taking proactive steps towards removal.

To effectively address these gaps in knowledge, considerations around the framing, distribution, and timing of messaging is equally as critical to the success of targeted awareness campaigns.

For example, financially vulnerable DIYers indicated that they rely on messaging that was informative and offered clear numbered steps that should be taken. This is to address their specific knowledge gaps around how to detect whether ACMs are present in their home [8]. Highlighting the years that homes were at risk of containing asbestos was also stated as something that was particularly important to this cohort. They are likely to complete further research online and benefit from clear direction on where to access further information [10].

In contrast, the well-heeled DIY enthusiasts and financially comfortable families tend to see their projects and themselves as more singular than they are. There is a disconnect between applying their existing knowledge to their current project, particularly if it is a small project. For example, installing new fixtures that require drilling [8,10]. The risks of encountering ACMs during a project is not front of mind, even though they are aware asbestos is or might be present in their home. Messaging should therefore act as a reminder to trigger their current understanding and act on the knowledge they already have [10]. As they complete multiple projects at the same time, they have reliance on information that is accessible and does not require further research.

When studying the multicultural young urbanites, the findings from both the quantitative and qualitative 2021 Asbestos Safety and Home Improvement Research [8,10] showed that this segment feels less knowledgeable about asbestos when compared to the other segments. Respondents indicated that they rely heavily on the advice from professionals as they do not have the knowledge themselves on identifying potential ACMs [10]. Due to this, it has resulted in ACMs being detected later in the project [10]. Their preference included messaging that was informative on common locations of ACMs, whilst also reminding them about the health implications [10].

Although findings across both studies indicated that a one-size fits all messaging is no longer effective due to the different needs of each segment, consistency in messaging remains crucial in achieving good public health outcomes. To achieve consistency, ASEA, in consultation with a broad range of stakeholders, developed guides for communicating asbestos risk. The *Guidelines for communicating asbestos risk to the public* [23] is a 'how to' for developing effective messages to prevent or respond to asbestos exposure. The *Communicating asbestos facts and figures guide* [24] has model language that can be used to communicate key facts and figures with the aim of achieving nationally consistent messaging. Messaging within these guides specific to this cohort has also been informed by the findings of these studies. Combined, the guides will help communicators overcome the challenges involved in communicating about asbestos risks.

The quantitative and qualitative 2021 Asbestos Safety and Home Improvement Research [8,10] also revealed the preferred information sources for each of the segments, which informs the best way to deliver these targeted messages. Across the cohort, hard-

ware and home improvement shops, social media, TV, online advertising, and direct mail are the top preferences [8], but these rank differently for each segment.

Although preferred information sources vary between the segments, the timing of when the segments want and need the information is the same—at the beginning of the project. Specifically, the project idea stage or the project planning and research stage.

Using the statistical evidence and knowledge from these studies, ASEA was able to develop and launch a National Asbestos Awareness Campaign [26]. This was the first asbestos awareness campaign via paid advertising to be authorised by the Australian Government and run nationally. One of the target audiences for the national campaign was DIY home improvers, and the theme was focused on raising awareness of 'the proper and lawful disposal of asbestos waste' [26]. With DIY home improvers as the target audience, the campaign theme and assets were informed by the findings from the quantitative and qualitative studies [26]. Additionally, the campaign materials were distributed via paid advertising on the platforms that participants in the studies indicated as their preferred sources of information.

The overall impact of the quantitative and qualitative 2021 Asbestos Safety and Home Improvement Research [8,10], to date, has already proven to be significant.

6. Conclusions

It is evident from the quantitative and qualitative 2021 Asbestos Safety and Home Improvement Research [8,10] that there is a need to move away from a one-size-fits-all messaging model in attempting to improve awareness and influence behavioural change. Instead, efforts should focus on developing targeted awareness campaigns that deliver key messaging aimed at directly meeting the information needs of the target audience. Additionally, the format, delivery, and timing of the message needs to be considered to ensure the messages are seen by the intended audience through their preferred information source, and at a time during their home improvement project that encourages proactivity around asbestos [8,10].

Australia's ongoing challenge of legacy asbestos in the built environment, paired with an increasing prevalence of home improvement projects being undertaken across Australia [5], has given rise to concerns of increased exposure risk for the home improver cohort [7]. To our knowledge, this is the only study that addresses these critical issues and provides a detailed analysis of the segments within this high-risk asbestos exposure group. It is the first time a clear understanding of the segments that make up home improvers in Australia has been achieved, providing clarity and evidence for the development and prioritisation of targeted awareness campaigns to achieve behavioural change. To reduce asbestos-related diseases in Australia, it is crucial to continue working towards providing home improvers, as a high-risk cohort, with practical information that aims to prevent exposure to harmful asbestos fibres.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets are available from the corresponding author on reasonable request.

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Conflicts of Interest: The authors declare no conflict of interest.

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