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# Exclusion by Design: How Academic Prerequisites Propel Australia's Rural Doctor Shortage

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## Abstract

Australia faces ongoing rural medical workforce shortages linked to inequities in medical school access. Despite initiatives like the Rural Health Multidisciplinary Training program, academic prerequisites and university admissions criteria, disproportionately exclude rural and low socioeconomic status students, reinforcing structural barriers that challenge equitable medical education and rural workforce sustainability.

The article aims to examine the multilayered barriers influencing rural and low socio-economic status student pathways into medical education, focusing on inequities linked to subject prerequisite policies. It uses a rapid review applying the Social-Ecological Framework to examine recent literature from Australia exploring systemic, institutional, community, interpersonal, and individual factors affecting rural and low socio-economic status students' access to medicine.

Structural inequities in school resourcing and decentralised policies limit rural and low socio-economic status students' access to prerequisite subjects. Medical admissions reinforce these barriers through rigid requirements. Community isolation, scarce role models, inconsistent institutional support, and limited guidance further hinder access. Despite these challenges, rural students perform equally well once admitted, highlighting the need for equitable pathways and support.

The evidence shows academic prerequisites create systemic barriers limiting rural and low socio-economic status student medical school access. The Social-Ecological Framework highlights multilayered inequities across policy, institutional, community, and individual levels, emphasising the need for evidence-based reforms to promote equitable medical education access. Rigid academic prerequisites significantly restrict rural and low socio-economic status students' medical school access. Evidence-based, coordinated reforms are essential to build a diverse, sustainable rural medical workforce.

**Keywords:** *rural medical education, admissions policy, subject prerequisites, medical education equity, social-ecological framework*

## Introduction

Australia continues to face persistent and significant shortages of medical professionals in rural and remote regions, which poses ongoing challenges for health service delivery and community wellbeing. The severity of Australia's rural medical workforce shortage highlights an urgent need

to remove barriers limiting rural students' entry into medicine. Increasing rural-origin medical graduates is one of the most effective strategies to enhance equitable healthcare access and outcomes in underserved communities (McGrail et al., 2023). Recent research indicates the greatest shortfalls in medical professional staffing are observed not just in very remote communities, but surprisingly in small rural towns, where doctor-to-population ratios are approximately one-third of those seen in metropolitan areas (Cortie et al., 2025). Rural Australians have access to fewer general practitioners and allied health professionals per capita, as well as fewer healthcare services, contributing to reduced healthcare access despite overall workforce growth (Cortie et al., 2025). These shortages are compounded by economic and logistical challenges that limit the sustainability of health services in the less populated, rural context, necessitating urgent attention to workforce recruitment and retention.

A critical factor influencing rural medical workforce distribution is the background of medical students themselves. Recent national survey data shows that students from rural backgrounds are far more likely to practice in rural areas compared to their metropolitan peers, with 62% of rural background students intending to work rurally after graduation versus only 19% of students from non-rural backgrounds (Medical Deans Australia and New Zealand, 2025). Importantly, Aboriginal and Torres Strait Islander students, who are disproportionately represented at the intersection of rurality and low socioeconomic status (SES), face entrenched educational inequities that further compound barriers to accessing medical education (Australian Institute of Health and Welfare & National Indigenous Australians Agency, 2024). This rural background effect is well established in Australian medical workforce research and has been found to persist throughout a graduate's career, with rural-origin doctors more likely to commence, remain, and return to rural practice (McGrail et al., 2023; Walters et al., 2016).

The workforce gap in rural and remote areas have profound implications for direct health outcomes and social equity. Rural residents face higher rates of preventable hospitalisations, reduced life expectancy of up to 13 years less in very remote areas compared to metropolitan regions, and greater burden of chronic disease and avoidable mortality (National Rural Health Alliance, 2025). Access disparities, including longer waiting times for appointments and limited primary healthcare availability, exacerbate these inequities (National Rural Health Alliance, 2025). Beyond health consequences, these shortages reflect systemic social injustices that disadvantage rural populations and entrench geographic and SES-based health inequity. Securing a sustainable rural medical workforce is crucial to redressing these inequities and fulfilling the nation's commitment to equitable health outcomes and social responsibility.

Among the most prominent barriers to medical school entry are high Australian Tertiary Admission Rank (ATAR) requirements and rigid academic prerequisites, such as secondary school chemistry, which collectively act as silent gatekeepers to tertiary health programs. These requirements disadvantage students in smaller, rural, and low SES schools, where resources and curriculum offerings are constrained, and advanced level science subjects may not be available. While entry prerequisites have traditionally been justified as measures of academic readiness, emerging research questions their predictive value for later performance in medical training and practice (Shepherd et al., 2025).

Addressing these persistent workforce maldistributions requires coordinated policy responses and targeted initiatives, such as the Rural Health Multidisciplinary Training (RHMT) program and targeted outreach by the Department of Education, including the Higher Education Participation and Partnerships Program (HEPPP) and Regional Partnerships Projects Pool Program (RPPPP) (Battye et al., 2020). These initiatives provide vital funding and support for equity in higher education; however, these programs alone cannot address entrenched academic entry requirements without aligned reforms in selection processes.

This rapid review explores how subject prerequisite policies, and broader systemic, institutional, and social factors jointly shape educational disadvantage for rural and low SES students in medical school admissions. The review is guided by the primary research question of how subject prerequisite policies, shaped by multiple systemic and contextual factors, affect rural and low SES students' access to medical education, given the known role of rural origin in medical workforce distribution. To address this, the review explores the reduced availability of advanced secondary school subjects in rural and low SES schools, the systemic factors contributing to these disparities, and the ways students compensate. It also examines how medical schools assess applicants without formal subject prerequisites, whether current equity initiatives effectively address these barriers, and how these challenges influence students' opportunities to pursue medicine.

The analysis draws on the Social-Ecological Framework (Gregson et al., 2001), which offers a comprehensive lens for examining the complex and multilayered factors influencing access to medical education. By considering the determinants at the structural, community, institutional, interpersonal, and individual levels, the Social-Ecological Framework enables a nuanced analysis of how barriers interact and compound disadvantage for rural and low SES students.

## Method

This study utilised a rapid review methodology to provide timely, policy-relevant insights into the barriers faced by rural and low SES students in accessing undergraduate medical education in Australia. The decision to conduct a rapid review, rather than a traditional systematic review, was driven by a need to synthesise and mobilise the current evidence in an accelerated manner. This approach has become increasingly prominent in education and health policy research settings where timely, evidence-based guidance is essential for informing reform and addressing ongoing or urgent workforce shortages. A systematic review, while offering the most comprehensive coverage and minimising bias, requires extensive time and resources, often taking many months or years to complete. In contrast, the rapid review accelerates knowledge synthesis by streamlining certain steps, such as limiting the number of databases searched, undertaking single-reviewer screenings, or prioritising higher-quality evidence, while still retaining methodological rigour and transparency in reporting (Hamel et al., 2021).

To support and enhance the efficiency of the review process, artificial intelligence (AI)-assisted tools were utilised throughout, assisting with initial source identification, keyword extraction, thematic analysis, and text summarisation. All AI outputs were critically evaluated by the single reviewer to ensure accuracy and relevance.

For the literature search, a review protocol was developed to clarify the research question, review scope, and eligibility criteria prior to commencement. An initial targeted search was conducted in May 2025 across two major databases, Scopus and Google Scholar, chosen for their broad coverage of medical education and equity research. Titles, abstracts, and keywords of relevant articles were analysed to develop refined search terms for a subsequent, more comprehensive search within the same databases. Search terms combined key words and phrases related to medical education admissions (e.g. "medical school admissions", "subject prerequisites", "academic requirements"), rural and low SES populations (e.g. "rural students", "low socioeconomic status", "educational disadvantage", "curriculum access"), and equity (e.g. "access", "barriers", "equity", "disadvantage"). The review focused primarily on studies published since 2020 to ensure currency and relevance in a policy environment experiencing rapid change. However, to ensure historical context and to capture influential policy analysis, seminal works published before 2020 were also considered, particularly if they were repeatedly cited in contemporary literature or included in key policy documents.

Screening and study selection were conducted by a single reviewer, who evaluated titles and abstracts for relevance before performing a full-text review of potentially eligible studies. Reference lists of all included papers were manually scanned to identify additional studies and policy documents that may not have emerged from database searching, a process recommended for enhancing the breadth of coverage in rapid reviews (Smela et al., 2023). Data extraction and quality appraisal were conducted manually by the single reviewer, focusing on information pertaining to subject prerequisite barriers, systemic and contextual influences, and reported interventions or policy approaches. Twelve articles were included in the final literature review (Table 1). Ethics approval was sought but deemed unnecessary for this synthesis of published literature.

**Table 1:** ***Summary of Included Studies***

| Author(s), Year | Population/ Setting | Methodology | Focus Area(s) | Key Findings |
|---|---|---|---|---|
| **Clemons et al., 2017** | 785 Australian first year tertiary chemistry students. | Mixed methods study (surveys, interviews)/ | Student perceptions of introductory chemistry topic. | Students overestimated the challenge and underestimated the time required for the topic. Almost 50% of the cohort subsequently chose majors where the unit was a prerequisite. |
| **Dean, Downes, et al., 2023** | All 436 New South Wales (Australia) government schools. | Quantitative analysis (administrative data). | Effect of socioeconomic status, location, and size on senior secondary curriculum access. | Rural areas, low socioeconomic status, and smaller schools offer fewer advanced subjects. |
| **Dean, Roberts, et al., 2023** | 73,351 final year students in 770 schools in New South Wales (Australia). | Quantitative analysis (administrative data). | Relationship between school socioeconomic composition and the availability and complexity of the academic curriculum. | Low socioeconomic status schools offer fewer academic subjects. |
| **Fox et al., 2025** | 18 aspiring medicine applicants in Queensland (Australia). | Qualitative study (interviews). | Applicant experiences navigating competitive admissions policies. | Rural applicants faced practical disadvantages, such as difficulty booking pre-admissions tests in regional locations. Experiences were significantly influenced by geographical location and available local support. |
| **Hoggan et al., 2009** | 461 students, 512 parents, 12 career counsellors of rural South Australian secondary schools. | Quantitative study (surveys and questionnaires). | Investigating the accuracy of information and perceptions about medical entry processes (grades required, subject prerequisites). | Students, parents, and advisors held inaccurate perceptions regarding the grades required and the need for prerequisite subjects, which acts as a barrier deterring rural students from applying to medicine. |
| **Huang et al., 2024** | 67 articles published between 2010 and 2024, focusing on undergraduate entry medical programs. | Systematic review and meta-analysis. | Appraising the effectiveness and predictive validity of common medical | Prior academic achievement is a predictor of academic performance. Effectiveness of selection tools in predicting |

| Author(s), Year | Population/ Setting | Methodology | Focus Area(s) | Key Findings |
|---|---|---|---|---|
| | | | student selection tools. | attainment in medical programs declines over time. |
| **Perry & Lubienski, 2020** | 17 secondary school leaders in metropolitan Perth (Australia) | Qualitative study (interviews). | Factors influencing school leaders' decisions on academic curriculum offerings in a marketized system. | Curricular offerings are driven by student demand and financial sustainability. Leaders of low socioeconomic schools reported the most resource constraints in offering academic curriculum. |
| **Perry & Southwell, 2014** | 121 secondary schools in metropolitan Perth (Australia) | Quantitative analysis (curriculum data). | Analysing how access to academic curriculum is patterned by school sector and socioeconomic composition. | Low socioeconomic status schools offer substantially less access to core advanced academic subjects. |
| **Reeves et al., 2020** | 25 articles published between 2000 and 2018 focusing on pipeline programs targeting underrepresented groups. | Systematic review. | Evaluating pre-application community engagement activities aimed at encouraging underrepresented groups to apply to medical school. | Successful pre-application programs target interested students and provide sustained support for attaining entry requirements. |
| **Roberts et al., 2019** | 73,371 final year students in New South Wales (Australia). | Quantitative analysis (administrative data). | Examining social inequity in the New South Wales secondary school curriculum hierarchy. | The curriculum is organised into a hierarchy linked to student socioeconomic status and final grades. |
| **Shepherd et al., 2025** | 22 rural background Australian medical students. | Qualitative study (interviews). | Exploring the accessibility of medical education for rural students and the intersection of rurality and socioeconomic privilege. | Access pathways are complex and require economic and social capital to navigate. Rural students face stigma and feelings of being an imposter or being labelled "fake rural". |
| **Southgate et al., 2015** | 33 secondary school students and 5 career advisors from New South Wales (Australia) government schools. | Qualitative study (focus groups and interviews). | Identifying barriers and enablers for lower socioeconomic status and first-in-family students aspiring to medical school. | Careers advisors identified the complexity of multi-pronged admission processes as a major barrier. Lower socioeconomic status students have limited opportunities to develop strategic knowledge and practices (termed "hot knowledge"). |

## Literature Review

### *Structure, Policy and Systems*

At the broadest level of the Social-Ecological Framework, system-wide education and admissions policies play a decisive role in shaping opportunities for rural and low SES students aspiring to medical careers. The intersection of market-driven educational policy, decentralised curriculum management, and university admissions requirements produces a landscape marked by persistent stratification and access disparities (Dean, Roberts, et al., 2023; Perry & Southwell, 2014; Perry & Lubienski, 2020). These influences span from local school policies to state and federal education frameworks, collectively determining the availability and quality of learning pathways for students. Understanding how these layers interact is essential in unpacking the complex barriers faced by rural and low SES students aspiring to medical education.

Australia's education system is characterised by marketisation, privatisation, and competition, which, while intended to foster improvement, instead has often exacerbated educational inequities (Dean, Roberts, et al., 2023; Perry & Southwell, 2014; Perry & Lubienski, 2020). This market-driven context means schools compete for students and resources, often to the detriment of smaller, less-resourced schools. Wealthier schools with higher enrolments can sustain a broader curriculum, including university prerequisites, whereas low SES schools, commonly found in rural areas, face both financial constraints and shrinking student numbers that limit their ability to offer advanced subjects (Dean, Roberts, et al., 2023; Perry & Southwell, 2014; Perry & Lubienski, 2020). This competition fosters stratification, where wealthier schools attract motivated students and secure superior staffing and facilities, further widening the opportunity gap for disadvantaged students.

Evidence shows that low SES schools consistently offer fewer academic subjects overall, particularly in advanced science, which are critical for medical program entry, than their higher SES counterparts, largely due to funding constraints and smaller enrolment sizes (Dean, Downes, et al., 2023; Dean, Roberts, et al., 2023; Perry & Southwell, 2014; Perry & Lubienski, 2020; Roberts et al., 2019). For example, only 9% of low SES government schools offer five key academic subjects, including chemistry (Perry & Southwell, 2014). Geographical challenges exacerbate these disparities, with regional and remote schools often delivering drastically fewer subjects than metropolitan schools. Remote government schools offer as few as nine academic subjects compared to 26 in metropolitan areas, leaving rural students with constrained options to meet university prerequisites (Dean, Downes, et al., 2023; Roberts et al., 2019).

Decentralised curriculum policies further entrench these disparities by allowing individual schools to determine subject offerings, often restricted by minimum enrolment policies. Smaller schools in rural and low SES areas rarely meet the threshold needed to offer low enrolment subjects such as advanced sciences, forcing students towards vocational pathways rather than university preparatory courses (Perry & Lubienski, 2020). School leaders' decisions about subjects to offer are also influenced by perceptions of student ability and aspirations, which may unintentionally limit opportunities for those aiming for tertiary education, perpetuating cycles of educational disadvantage (Perry & Lubienski, 2020).

Medical school admissions policies interact with these systemic barriers by maintaining rigid prerequisite requirements and high ATAR cut-offs, both of which function as filtering mechanisms that privilege well-resourced applicants and metropolitan schools. While equity schemes such as quotas, special admissions pathways, and bridging courses exist, evidence suggests they are insufficient to offset entrenched disadvantage and often introduce financial and psychological barriers (Southgate et al., 2015). There is now broad recognition that admissions policies, including the enduring reliance on traditional prerequisites, should be

reconsidered to avoid perpetuating inequity and to build a more diverse, representative medical workforce (Reeves et al., 2020; Shepherd et al., 2025).

Crucially, the structural dimensions of these policies also intersect with broader socioeconomic factors and colonial legacies to intensify disadvantage for Aboriginal and Torres Strait Islander students, who are disproportionately represented at the intersection of rurality and low SES (Australian Institute of Health and Welfare & National Indigenous Australians Agency, 2024; Shepherd et al., 2025). While equity programs such as the RHMT program, HEPPP, and RPPPP represent important, well-funded policy interventions, their impacts are undermined where systemic barriers like academic prerequisites persist. These policies must be critically evaluated and aligned, with more explicit recognition of the cumulative impact of socioeconomic, geographic, and cultural disadvantage within admissions frameworks.

Together, the data highlight how educational marketisation, decentralised curriculum decisions, and entrenched medical school admissions policies contribute to persistent barriers for rural and low SES students. Addressing these persistent barriers demands both structural reforms, such as reconsideration of subject prerequisites and ATAR thresholds, and improvements in targeted policy initiatives. Recognising the systemic and layered nature of these barriers is crucial before examining how institutional and community factors further influence student pathways towards medical education.

### *Community*

At the community level of the Social-Ecological Framework, formal or informal social networks, local norms, and community characteristics shape educational pathways and access to medical school. Rural and low SES communities often have limited learning resources and fewer medical role models, which can lower collective aspiration and limit exposure to healthcare careers (Hoggan et al., 2009; Southgate et al., 2015). Research consistently finds that rural applicants may experience social isolation or perceive medicine as unattainable, particularly when communities lack examples of local success in highly competitive professional fields (Hoggan et al., 2009; Roberts et al., 2019).

Socioeconomic factors intersect with geographic factors, with higher SES communities reporting greater success with medical school admission, highlighting how economic advantage amplifies medical education accessibility (Fox et al., 2025; Reeves et al., 2020). For Aboriginal and Torres Strait Islander students, these challenges are intensified by cultural connections to Country, understood as the lands, waters, skies, and spiritual relationships ground identity and belonging, and to community, which play a central role in identity formation and decision-making about relocation. Enhancing pathways that allow students to study close to home or remain embedded in community is therefore critical to culturally safe participation. Consequently, community engagement by educational and medical institutions has emerged as a crucial strategy to enhance inclusion and equity. Policies that are flexible and tailored to the strengths and needs of specific communities can help reduce local disadvantage and create more supportive learning environments for prospective medical students (Fox et al., 2025).

An important aspect of community engagement has emerged as the direct involvement of rural communities in medical school admissions decisions (Reeves et al., 2020). Involving community members in selection processes not only helps ensure candidates reflect the values and needs of the populations they are intended to serve but also mitigates potential biases in urban-centric admissions committees (Reeves et al., 2020) Such involvement ensures admissions processes are more socially accountable, reflective of rural values, and better align with the goal of producing doctors who are committed to serving rural communities (Reeves et al., 2020).

Building on the influence of community networks and local involvement, it is also essential to examine how institutional structures, policies, and practices within schools and universities further shape educational access and equity for prospective rural and low SES medical students.

### *Institutional*

At the institutional level of the Social-Ecological Framework, the informal and formal structures, rules, and policies of institutions, including universities and schools, shape access to medical education and equity outcomes for rural and low SES students. Medical schools and secondary schools operate within the frameworks that determine how resources are allocated, who is admitted, and what support is available, influencing the educational trajectories of aspiring medical students.

Australian medical school admissions policies remain highly competitive and continue to privilege students with strong academic records, a pattern that advantages those from higher SES and metropolitan backgrounds (Reeves et al., 2020). While many universities have introduced targeted equity measures, such as rural quotas, separate admissions pools, or bonus points, these efforts have only partially addressed entrenched disparities (Shepherd et al., 2025; Southgate et al., 2015). Admissions criteria that focus heavily on prior academic achievement and subject prerequisites can unintentionally reinforce social and academic elitism, with less regard for contextual disadvantage or diverse pathways (Reeves et al., 2020). Recent literature advocates for greater transparency, social accountability, and responsiveness within admissions, including clearer communication about selection criteria, equal access to preparatory resources, and direct engagement with community stakeholders to align institutional processes with equity goals (Huang et al., 2024).

Secondary schools are critical in preparing students for medical school, however, their capacity to do so varies widely depending on geographic location and community SES. For some low SES and rural schools, inter-school consortia or distance education, such as the School of Isolated and Distance Education, have been implemented to broaden subject access. Despite these efforts, such solutions are often challenged by logistical complexities, additional costs, and issues of acceptance or student preference, limiting their overall effectiveness (Perry & Lubienski, 2020). Decisions around subject offerings remain influenced by school size, leadership philosophy, and perceived aspirations of the student cohort, factors that often disadvantage aspiring university students in smaller, low SES, and rural schools (Perry & Lubienski, 2020).

Institutional support through career guidance and outreach programs varies significantly by school location and type, often constrained by limited resources and competing immediate student needs (Fox et al., 2025). While such programs aim to demystify the admissions process and support student aspiration, their reach and efficacy are often limited, with many rural and low SES students having limited access to sustained mentoring, meaningful exposure to medical environments, and early intervention initiatives (Fox et al., 2025; Southgate et al., 2015). These supports, when present, correlate with improvement in preparation and motivation; however, their distribution heavily depends on institutional commitment and resource availability, highlighting the critical role of administrative prioritisation in addressing inequities (Fox et al., 2025; Reeves et al., 2020).

Overall, institutional policies and practices play a pivotal role in shaping educational equity. Despite progress made through targeted initiatives, systemic barriers embedded in admissions criteria, resource allocation, and institutional support remain significant obstacles for rural and low SES students seeking to enter medicine. Notably, recent shifts in admissions criteria, including the gradual removal of specific subject prerequisites by some medical schools, signal evolving institutional recognition of these barriers, offering pathways towards more inclusive admissions frameworks.

### *Interpersonal*

The interpersonal sphere of the Social-Ecological Framework considers the influence of family, friends, peers, and role models on educational aspirations and pathways. These close social relationships provide essential social identity, emotional support, and access to informal knowledge that can greatly impact an individual's ability to navigate complex medical admissions processes.

For aspiring medical students from low SES or rural backgrounds, family support often cannot guide complex university admissions processes, with many being first-generation applicants who lack professional or medical networks (Southgate et al., 2015). This absence of "hot knowledge", firsthand advice from experienced individuals that is more readily available to students from privileged backgrounds, places these students at a disadvantage when navigating subject selection and preparing competitive applications (Southgate et al., 2015). This informational gap can lead to misunderstandings about prerequisites and discourage potential applicants from pursuing medicine (Shepherd et al., 2025).

Peer and social networks further shape awareness and preparedness. Many rural and low SES students report limited exposure to others pursuing medicine, which can delay or deter their ambitions, particularly when medicine is perceived as a career for the privileged or well-connected (Fox et al., 2025; Shepherd et al., 2025). Within medical schools, students from metropolitan, high SES schools often form close-knit groups that act as social and cultural capital, making rural and disadvantaged students feel isolated and less supported (Shepherd et al., 2025; Southgate et al., 2015). This dynamic can contribute to feelings of exclusion, imposter syndrome, and other psychological barriers to full participation (Shepherd et al., 2025; Southgate et al., 2015).

Mentorship and exposure to role models are powerful facilitators for students considering medical careers. Rural-oriented role models, targeted mentoring, and exposure to medical career pathways have been shown to boost applicants' preparedness and confidence, as well as improve retention and workforce outcomes for rural students (Reeves et al., 2020; Southgate et al., 2015). However, opportunities for such guidance remain inequitably distributed, thereby compounding the advantages of those with existing connections and perpetuating cycles of underrepresentation.

These interpersonal influences shape not only students' immediate networks but also contribute to the development of personal attitudes, knowledge, and resilience, which are explored in the individual-level factors that further impact access to medical education.

### *Individual*

The individual sphere of the Social-Ecological Framework focuses on personal characteristics, including knowledge, attitudes, beliefs, and personality traits that influence educational pathways and access to medical school. Among rural and low SES applicants, individual factors including academic preparedness, motivation, resilience, and self-identity play critical roles in shaping their journey to medical education.

Rural students frequently express concerns about their academic preparedness and competitiveness for medical school, often linked to perceived isolation from key learning opportunities (Fox et al., 2025). Despite these concerns, research indicates that once admitted, students from rural and low SES backgrounds perform as well as peers from more advantaged settings, suggesting that preparation gaps do not reflect inherent ability but rather access disparities (Fox et al., 2025). Exposure to rural clinical schools and rural placements additionally shapes motivation towards rural practice, reinforcing the importance of experiential factors in complementing individual characteristics (Reeves et al., 2020; Southgate et al., 2015).

Access to accurate information and confidence in navigating admissions is inequitable. Insufficient knowledge about prerequisites and the complexity of admissions processes discourages many talented applicants, particularly when students and parents erroneously believe that certain secondary school subjects are always required (Hoggan et al., 2009; Shepherd et al., 2025). Where subject availability is limited, students may miss out on prerequisites, constraining their university options (Dean, Roberts, et al., 2023).

Students' aspirations and identities are shaped by the expectations communicated within their schools and communities, with some rural students reporting discouragement from ambitious goals and 50% experiencing pronounced feelings of impostor syndrome (Shepherd et al., 2025). These psychological barriers, linked closely with external social influences such as perceived exclusion and limited peer networks, compound challenges in educational pathways, with curriculum differentiation and lack of encouragement further intensifying self-doubt and lowering educational expectations, especially for students at the intersection of rurality and low SES (Dean, Downes, et al., 2023; Southgate et al., 2015).

To compensate for missing prerequisites, some students enrol in bridging or introductory university science courses, or pursue graduate-entry medical programs, which can extend the journey and pose additional financial and personal challenges (Clemons et al., 2017; Shepherd et al., 2025). These compensatory strategies may work for some, but for many, the compounding effect of academic barriers, perceived disadvantage, and fewer resources intensifies the challenge of accessing medical education.

Together, these individual-level factors illustrate the personal challenges faced by rural and disadvantaged students on their path to medical education, highlighting the importance of supporting not only academic preparedness but also motivation, identity formation, and access to information.

## Discussion

This rapid review demonstrates that longstanding academic prerequisite policies, serve as systemic barriers limiting medical school access for rural and low SES students. Rather than arising from differences in capability or motivation, these barriers reflect deeply rooted inequities in school resourcing, curriculum policy, and university admissions practices. Such exclusionary mechanisms not only undermine efforts to diversify the medical workforce but threaten the sustainability of the RHMT program and similar rural health initiatives (Battye et al., 2020; Dean, Downes, et al., 2023; Dean, Roberts, et al., 2023; Perry & Lubienski, 2020).

By applying the Social-Ecological Framework, the review reveals a comprehensive understanding of how barriers to medical school access operate at multiple interconnected levels, ranging from broad systemic policies and institutional practices to community contexts, interpersonal relationships, and individual experiences. This multilevel lens highlights the complexity of inequities faced by rural and low SES students, as well as the urgent need for coordinated, contextual strategies that address each level to effectively promote equitable opportunities in medical education.

At the broader systems and policy level, entrenched funding disparities, decentralised subject selection, and competitive educational markets continue to restrict access to advanced sciences in low SES and rural schools. These limitations, compounded by a reliance on inherited or traditional subject prerequisites in medical school admission, mean students from marginalised backgrounds are systematically filtered out before they can even apply. The evidence suggests many prerequisite policies lack rigorous empirical justification, persisting largely out of tradition rather than their demonstrated relevance to medical preparedness or success (Shepherd et al., 2025). Without transparent, evidence-based policy reviews and systematic evaluation, these

outdated prerequisites risk perpetuating structural exclusion and undermining national efforts to widen participation (Reeves et al., 2020).

Institutional practices at university and school levels further magnify these inequities. Admissions criteria heavily weighted towards academic performance and specific subject completions, while intended to ensure preparedness, tend to favour applicants from well-resourced, metropolitan schools (Reeves et al., 2020). Although rural quotas, special consideration pathways, and bridging programs provide support for disadvantaged students, they only partially address these barriers and can introduce additional financial and psychological burdens (Shepherd et al., 2025). To transform these policies into meaningful opportunities, institutions must not only provide tailored support and resources to students admitted without traditional prerequisites, but also critically assess whether these requirements align with actual curricular needs and outcomes, rather than simply existing to decrease admission staff workload.

Community and interpersonal influences remain consequential. Prerequisite barriers send strong signals to rural and low SES communities about the accessibility of a medical career, reinforcing perceptions of exclusion and deterring capable applicants. Feelings of isolation, lack of representation, and reduced exposure to successful role models dampen aspirations and inhibit knowledge-sharing (Fox et al., 2025; Shepherd et al., 2025). Addressing these issues requires policy not only to remove structural barriers but also to proactively involve rural communities in the development of admissions processes, ensuring selection criteria are reflective of diverse local realities and aspirations (Reeves et al., 2020).

At the individual level, the cumulative effect of structural, institutional, and social barriers shapes confidence, aspirations, and preparedness. Many rural and low SES students are deterred at an early stage by late or insufficient information, misconceptions about prerequisite requirements, or simply the daunting prospect of overcoming additional hurdles (Fox et al., 2025; Southgate et al., 2015). Those who persist often face long and costly routes into medicine, further diminishing the pool of qualified rural applicants (Shepherd et al., 2025).

Though beyond the primary scope of this review, evidence indicates that ATAR thresholds represent a significant barrier for rural and low SES students seeking medical school entry (Dean, Downes et al., 2023; Southgate et al., 2015; Roberts et al., 2019). High ATAR requirements, often intertwined with subject prerequisites, systematically filter out capable students from disadvantaged backgrounds (Roberts et al., 2019). Future research and admission reform must therefore consider both academic prerequisites and ATAR cut-offs to ensure equitable access.

Whilst this rapid review did not extensively uncover research focused on Aboriginal and Torres Strait Islander students, there is substantial scholarship beyond this review highlighting the complex structural, institutional, and social barriers rooted in colonial legacies that unjustly affect these students, especially those disproportionately represented at the intersection of low SES and rurality (Australian Institute of Health and Welfare & National Indigenous Australians Agency, 2024). Aboriginal and Torres Strait Islander students bring profound connections to Country, community, and Indigenous knowledge systems that are fundamental to health and wellbeing, and shape their educational experiences profoundly (Harrison et al., 2019). Current university admissions policies, including ATAR and subject prerequisite requirements, prioritise Western scientific models and often marginalise Indigenous epistemologies, creating additional challenges for Aboriginal and Torres Strait Islander students pursuing cultural knowledge and empowerment. To address these barriers, admissions frameworks must genuinely value Indigenous epistemologies and empower students to draw on their strengths in culturally appropriate pathways into medicine.

This rapid review provides compelling evidence that academic prerequisite policies constitute a significant systemic barrier for rural and low SES students aspiring to medical education. These barriers are not attributable to lack of ability or motivation but instead are rooted in broader

inequities in school resourcing, curriculum offerings, and university admissions practices. Maintaining such prerequisite policies risks perpetuating these inequities, limiting diversity within medical cohorts, and undermining rural health workforce sustainability. Removing or revising these rigid course requirements, alongside multilevel institutional and community interventions, is essential not only to create equitable pathways into medicine for underrepresented populations but also to improve rural health workforce numbers and ultimately enhance health outcomes in rural communities.

### *Strengths, Limitations and Implications*

A key strength of this review is its nuanced, multilevel synthesis of evidence that highlights how prerequisite subject requirements interact with systemic inequities to restrict medical school access for underrepresented rural and low SES groups. By applying the Social-Ecological Framework, the review comprehensively explores how barriers function across interconnected policy, institutional, community, interpersonal, and individual levels, providing clarity on the complex and overlapping nature of these inequities. Additionally, the focus on recent research ensures findings are relevant and actionable within contemporary national debates on widening participation in medical education.

The use of a rapid review methodology imposes important limitations. While rapid reviews offer the advantage of delivering timely, focused evidence summaries conducive to informing policy and practice, the abbreviated search and synthesis process may lead to omission of some relevant studies or nuanced findings that a full systematic review could capture. The accelerated nature of this approach necessitates prioritising expediency over comprehensiveness, which may limit the depth of critical appraisal and risk introducing bias (Hamel et al., 2021). This review prioritised currency and policy relevance by limiting database searches to articles published from 2020 onward. However, seminal works published prior to this date were judiciously included via manual reference list screening to provide historical context and foundation. This approach aimed to balance efficiency with comprehensiveness but may overlook some older or less accessible studies, a recognised limitation in rapid review methodology (Hamel et al., 2021). Additionally, the emphasis on the Australian context may limit the applicability of these conclusions to other countries with differing educational systems or medical admissions processes, or to emerging and innovative admissions models.

An important limitation of this review is the absence of extensive research specifically addressing Aboriginal and Torres Strait Islander students within the search results. This gap highlights the need for dedicated Indigenous-focused literature reviews and integration of such perspectives across medical education research to adequately capture and address the unique structural, cultural, and epistemological barriers faced by Aboriginal and Torres Strait Islander students. This acknowledgement does not diminish the implications drawn but highlights the necessity of more targeted research and culturally informed policy development.

The implications of this review are clear: universities and policymakers must move beyond the complacency of inherited prerequisite practices and rigorously scrutinise the necessity and impact of every course requirement, including secondary school chemistry for medical school admission, which systematically disadvantages rural and low SES students. Prerequisite requirements must be justified by robust, transparent evidence demonstrating their indispensability for academic and professional success, rather than being perpetuated by tradition or institutional mimicry. Resources should be strategically targeted to support applicants from non-traditional backgrounds, while admissions frameworks must be reimagined to reflect the diverse realities and strengths of all communities. Universities must urgently implement additional special entrance considerations for rural and low SES applicants and provide tailored support for those admitted without traditional prerequisites, ensuring these reforms align with workforce needs. Only by aligning admissions policies with genuine evidence

and the needs of local communities can universities fulfil their responsibility to foster a diverse, competent, and sustainable medical workforce (Reeves et al., 2020; Shepherd et al., 2025).

## Conclusion

This rapid review demonstrates that academic prerequisite policies and admissions criteria, continue to act as significant barriers for rural and low SES students aspiring to medical education in Australia. These barriers arise not from students' lack of ability or ambition, but from systemic inequities in curriculum access, funding distribution, and admissions processes, which collectively undermine efforts to build a diverse and sustainable rural medical workforce.

The implications of these findings are profound when viewed against the backdrop of Australia's ongoing rural medical workforce shortage. With many regions facing critical shortages of general practitioners and medical specialists, translating directly into poorer health outcomes and significant social inequities, removing or revising rigid university admissions policies is critical not only to expanding access to medical education but also to strengthening the rural health workforce. Enabling more rural and disadvantaged students to enter medical programs will increase the pool of practitioners familiar with, and committed to serving, rural communities. This expansion can ultimately improve healthcare accessibility and contribute to closing the urban-rural health gap.

Addressing these disparities requires medical schools and policymakers to not only critically and transparently reassess the necessity of subject prerequisites, but also to transparently reassess the broader admissions landscape for alignment with workforce needs and equity goals. Utilising the Social-Ecological Framework to guide reforms emphasises the importance of coordinated efforts across structural, institutional, community, interpersonal, and individual domains.

Developing evidence-based alternative pathways, implementing special consideration processes, and tailored support for disadvantaged students are essential steps towards admissions policies that reflect the realities of underrepresented groups. Achieving these reforms demands sustained collaboration between educational institutions, policymakers, rural communities, and students to build inclusive and effective medical school pathways. Only through such concerted efforts can Australia realise a medical workforce that is truly representative of, and responsive to, the diverse and resilient communities it aims to serve.

## References

Australian Institute of Health and Welfare & National Indigenous Australians Agency. (2024). *Measure 2.09 Socioeconomic indexes, Aboriginal and Torres Strait Islander Health Performance Framework website*. https://www.indigenoushpf.gov.au/measures/2-09-socioeconomic-indexes

Battye, K., Sefton, C., Thomas, J. M., Smith, J., Springer, S., Skinner, I., Callander, E., Butler, S., Wilkins, R., Gordon, J., & Kelly, K. (2020). *Independent evaluation of the rural health multidisciplinary training program: Final report to the commonwealth Department of Health*. https://www.health.gov.au/sites/default/files/2023-03/evaluation-of-the-rural-health-multidisciplinary-training-rhmt-program-final-report.pdf

Clemons, T. D., Bucat, R. B., & Spagnoli, D. (2017). First year introductory chemistry at the University of Western Australia: Reflections and perceptions. *Australian Journal of Chemistry*. https://doi.org/10.1071/CH17359

Cortie, C. H., Garne, D., Parker-Newlyn, L., Ivers, R. G., Mullan, J., Mansfield, K. J., & Bonney, A. (2024). The Australia health workforce: Disproportionate shortfalls in small rural towns. *Australian Journal of Rural Health, 32*(3), 538-546. https://doi.org/10.1111/ajr.13121

Dean, J., Downes, N., & Roberts, P. (2023). Access to and equity in the curriculum in the Australian government secondary school system. *SN Social Sciences*, *3*(4), 64. https://doi.org/10.1007/s43545-023-00641-7

Dean, J., Roberts, P., & Perry, L. B. (2023). School equity, marketisation and access to the Australian senior secondary curriculum. *Educational Review*, *75*(2), 243–263. https://doi.org/10.1080/00131911.2021.1909537

Fox, J., Saluja, S., Batacan, R., Jr., Pullen, C., Yong, F., & McGrail, M. (2025). Rural and metropolitan applicants' experiences of the admissions process for a provisional entry regional medical training pathway. *Australian Journal of Rural Health*, *33*(1), e13211. https://doi.org/10.1111/ajr.13211

Gregson, J., Foerster, S. B., Orr, R., Jones, L., Benedict, J., Clarke, B., Hersey, J., Lewis, J., & Zotz, K. (2001). System, environmental, and policy changes: Using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of Nutrition Education*, *33*, S4–S15. https://doi.org/10.1016/S1499-4046(06)60065-1

Hamel, C., Michaud, A., Thuku, M., Skidmore, B., Stevens, A., Nussbaumer-Streit, B., & Garritty, C. (2021). Defining rapid reviews: A systematic scoping review and thematic analysis of definitions and defining characteristics of rapid reviews. *Journal of Clinical Epidemiology, 129,* 74–85. https://doi.org/10.1016/j.jclinepi.2020.09.041

Harrison, N., Tennent, C., Vass, G., Guenther, J., Lowe, K., & Moodie, N. (2019). Curriculum and learning in Aboriginal and Torres Strait Islander education: A systematic review. *The Australian Educational Researcher*, *46*(2), 233–251. https://doi.org/10.1007/s13384-019-00311-9

Hoggan, B., Laven, G., Newbury, J., Laurence, C., Ryan, V., Baillie, S., & Baker, F. (2009). Rural student entry into a medical course: A South Australian rural high school perspective. *Rural and Remote Health*, *9*(4). https://doi.org/10.22605/RRH1223

Huang, P.-H., Arianpoor, A., Taylor, S., Gonzales, J., & Shulruf, B. (2024). Insights into undergraduate medical student selection tools: A systematic review and meta-analysis. *Journal of Educational Evaluation for Health Professions*, *21*, 22. https://doi.org/10.3352/jeehp.2024.21.22

McGrail, M. R., Doyle, Z., Fuller, L., Gupta, T. S., Shires, L., & Walters, L. (2023). The pathways to more rural doctors: the role of universities. *Medical Journal of Australia, 219*(3), S8-S13. https://doi.org/10.5694/mja2.52021

Medical Deans Australia and New Zealand. (2025). *Medical schools outcomes database national data report 2025*. https://medicaldeans.org.au/md/2025/05/MSOD-National-Data-Report-2025_FINAL-1-1.pdf

National Rural Health Alliance. (2025). *Rural health in Australia snapshot 2025.* *https://www.ruralhealth.org.au/wp-content/uploads/2025/02/NRHA-Rural-Health-in-Australia-Snapshot-2025.pdf*

Perry, L., & Lubienski, C. (2020). Between-school stratification of academic curricular offerings in upper secondary education: School decision-making, curriculum policy context, and the educational marketplace. *Oxford Review of Education*, *46*(5), 582–600. https://doi.org/10.1080/03054985.2020.1739012

Perry, L. B., & Southwell, L. (2014). Access to academic curriculum in Australian secondary schools: A case study of a highly marketised education system. *Journal of Education Policy*, *29*(4), 467–485. https://doi.org/10.1080/02680939.2013.846414

Reeves, N. S., Cheek, C., Hays, R., Sargent, A., McComiskie, A., Santini, C., Nguyen, J., Chalwe, K., & Mubarak, A. (2020). Increasing interest of students from under-represented groups in medicine—A systematised review. *Australian Journal of Rural Health*, *28*(3), 236–244. https://doi.org/10.1111/ajr.12609

Roberts, P., Dean, J., & Lommatsch, G. (2019). *Still Winning? Social Inequity in the NSW Senior Secondary Curriculum Hierarchy (Monograph Series No. 1).* Centre for Sustainable Communities. https://researchsystem.canberra.edu.au/ws/portalfiles/portal/52676881/Still_Winning_.pdf

Shepherd, N., Wilson Gray, R., Hu, W., Hyde, S., Partanen, R., Pena, A., Walters, L., & Olson, R. (2025). I'm not 'fake rural': Rural student negotiation of identity and place in medical school. *Sociologia Ruralis*, *65*(1), e12473. https://doi.org/10.1111/soru.12473

Smela, B., Toumi, M., Swierk, K., Francois, C., Biernikiewicz, M., Clay E., & Boyer, L. (2023) Rapid literature review: Definition and methodology. *Journal of Market Access & Health Policy,* 11(1), 2241234. https://doi.org/10.1080/20016689.2023.2241234

Southgate, E., Kelly, B. J., & Symonds, I. M. (2015). Disadvantage and the 'capacity to aspire' to medical school. *Medical Education*, *49*(1), 73–83. https://doi.org/10.1111/medu.12540

Walters, L., Seal, A., McGirr, J., Stewart, R. A., DeWitt, D., & Playford, D. (2016). Effect of medical student preference on rural clinical school experience and rural career intentions. *Rural and Remote Health. 16*(4), 3698-3707. https://doi.org/10.22605/RRH3698