

# Current evidence and opportunities in child and adolescent public mental health: a research review

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**Background:** A public mental health lens is increasingly required to better understand the complex and multifactorial influences of interpersonal, community and institutional systems on the mental health of children and adolescents. **Methods:** This research review (1) provides an overview of public mental health and proposes a new interactional schema that can guide research and practice, (2) summarises recent evidence on public mental health interventions for children and adolescents, (3) highlights current challenges for this population that might benefit from additional attention and (4) discusses methodological and conceptual hurdles and proposes potential solutions. **Results:** In our evidence review, a broad range of universal, selective and indicated interventions with a variety of targets, mechanisms and settings were identified, some of which (most notably parenting programmes and various school-based interventions) have demonstrated small-to-modest positive effects. Few, however, have achieved sustained mental health improvements. **Conclusions:** There is an opportunity to re-think how public mental health interventions are designed, evaluated and implemented. Deliberate design, encompassing careful consideration of the aims and population-level impacts of interventions, complemented by measurement that embraces complexity through more in-depth characterisation, or ‘phenotyping’, of interpersonal and environmental elements is needed. Opportunities to improve child and adolescent mental health outcomes are gaining unprecedented momentum. Innovative new methodology, heightened public awareness, institutional interest and supportive funding can enable enhanced study of public mental health that does not shy away from complexity. **Keywords:** adolescence; child development; mental health; public health; intervention; school.

## Introduction

The momentum is building to harness scientific knowledge in more comprehensive, consistent and cohesive ways to address growing concerns around child and adolescent mental health difficulties. There are many reports of an apparent recent increase in mental health difficulties in this population (Newlove-Delgado et al., 2021; Pitchforth et al., 2019), which may be explained by a range of contributing factors. The documented increases in diagnosis and use of mental health services may suggest a true increase in prevalence, but could also be explained in part by factors such as improved recognition of mental health difficulties, increased help-seeking behaviours and evolving diagnostic classifications (Collishaw, 2015). More recently, estimates from large national survey data suggest that the prevalence of probable mental illness substantially increased in the first months of the pandemic (Newlove-Delgado et al., 2021), with potential causes spanning multiple systems, from the family and peer environment to national policy.

The most prominent focus in addressing child and adolescent mental health difficulties has been on discovering and addressing individual causative factors, whilst measuring the broader system-wide influences on mental health remains a relatively under-explored area (Arango et al., 2018; Patton et al., 2016). Yet, the multiple and interacting systems within which developing children and

adolescents live undoubtedly exert an influence on all aspects of their health, including mental health. Furthermore, mental health interventions are not necessarily confined to an individual psychological and/or pharmacological approach, and many children and adolescents could stand to benefit from interventions that take a broader view of the multitude of interpersonal-, community- and institutional-level factors that influence mental health. Such interventions, which fall under the domain of public mental health, are the focus of this review.

In the following sections, we will

- 1 provide an overview of public mental health and propose a schema that focuses on influences and public health intervention targets for child and adolescent mental health difficulties,
- 2 review recent evidence pertaining to public mental health interventions for this population, focusing on high-income countries,
- 3 discuss examples of current challenges, described as ‘modern matters’, where public mental health approaches may be vital but current evidence is insufficient and
- 4 identify and propose possible solutions for methodological and conceptual hurdles in the field.

## What is public mental health?

Capturing the full remit of public health approaches can be challenging given the potential breadth of the subject, but one common definition is that public

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health comprises society's efforts to 'protect, promote and restore' the health of the population as a whole, primarily through 'collective or social actions' (Last, 2001, p. 145). As such, the primary features that differentiate a public mental health approach from an individual-centred clinical approach are its emphasis on prevention over treatment (Fusar-Poli et al. (2021), use of population-based strategies and advocacy for collective societal action (Last, 2001).

There are several frameworks that can help model public mental health approaches. In terms of potential interventions, one of the most commonly used models is that of the Institute of Medicine (IOM) (1994) which has three 'tiers' of prevention: *universal prevention* (targets 'the general public or a whole population group that has not been identified on the basis of individual risk'); *selective prevention* (targets 'individuals or a subgroup of the population whose risk of developing mental disorders is significantly higher than average') and *indicated prevention* (targets 'high-risk individuals who are identified as having minimal but detectable signs or symptoms' foreshadowing mental health disorders but who do not currently meet diagnostic criteria). There has been subsequent discussion that the IOM model should also include strategies to build positive mental health and wellbeing across the population, known as mental health *promotion* (World Health Organization, 2004).

Other relevant models focus on the factors that influence child health and development, which can help identify potential targets of public mental health interventions, including risk and protective factors for the development of mental illnesses. These include the Dahlgren and Whitehead (1991) model, Pearce and colleagues' (2019) adaptation for child health and the Bronfenbrenner and Morris (2007) Process-Person-Context-Time model, the first two being relatively more common in public health and the latter in child development. These models, which each depict the complex and multi-layered influences on child health and development, have rightly contextualised the individual child within a broader world view that encompasses parental, familial, community and societal elements.

When considering child and adolescent mental health from a public health perspective, however, the pathway from developmental influences to public health interventions might be better represented in a schema that places emphasis on the interactional and interdependent components of child and adolescent development (Figure 1).

The schema combines many of the key elements from the models and frameworks described above. Like its predecessors, the schema overviews a broad range of complex and multi-level factors that can have a positive or negative influence on child and adolescent mental health (Bronfenbrenner & Morris, 2007; Dahlgren & Whitehead, 1991; Pearce et al., 2019). The schema also recognises the

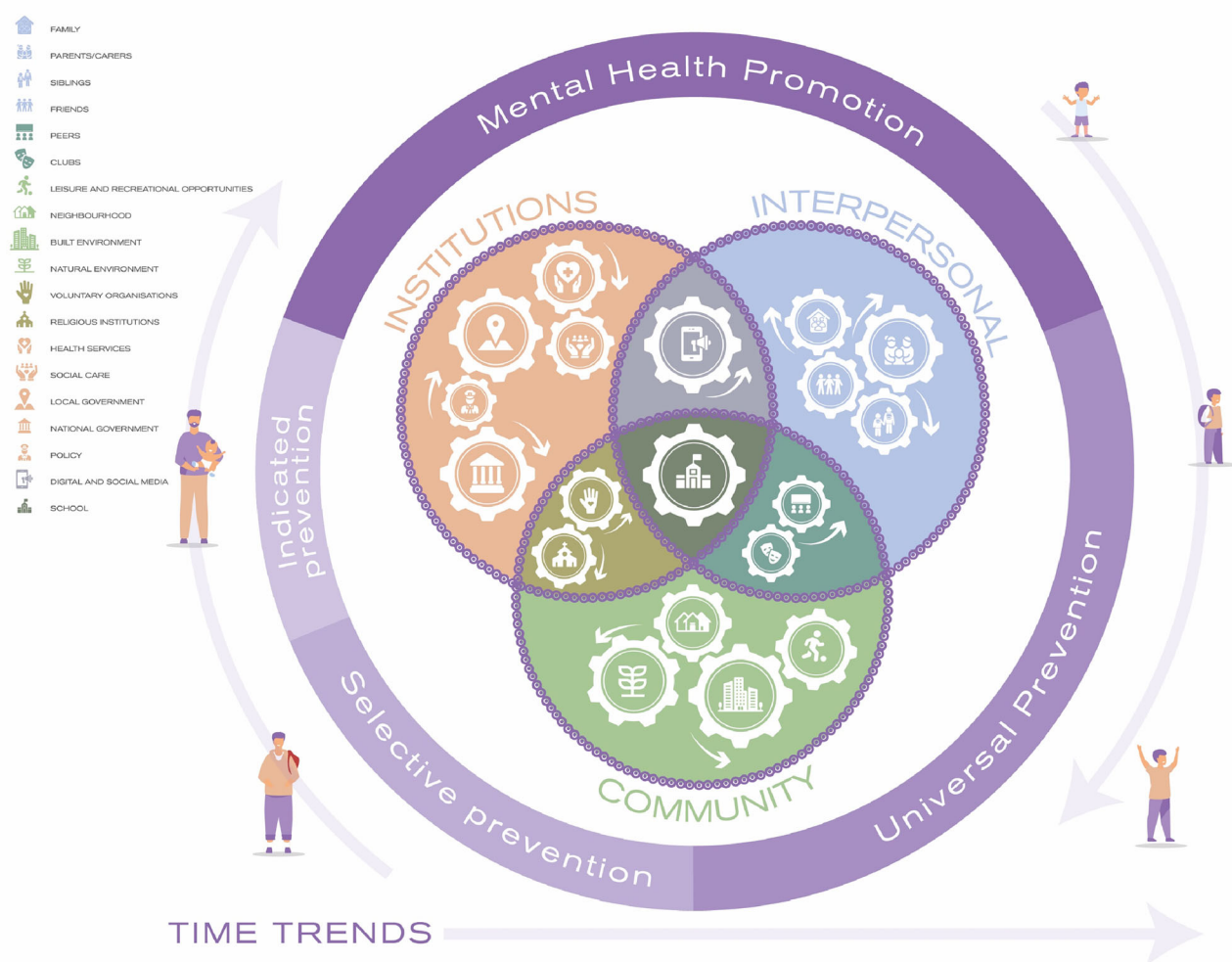
influence of time (both developmental and secular (historical)), which has received more attention in child development models than in public health models, but which is salient for the design of public mental health interventions. Finally, in an attempt to connect intervention targets and approaches, the schema includes the tiered system of public mental health interventions, with potentially overlapping and additive domains of promotion and prevention (World Health Organization, 2004).

This interactional public mental health schema has, however, two key differences compared with the previous models. First, we have chosen to remove the individual from the centre of a series of concentric spheres of influence (as seen in Dahlgren & Whitehead, 1991; Pearce et al., 2019), which reflects a key distinction between clinical and public health approaches. With the individual at the centre, there might be an interpretation that clinical or other individual-focused interventions may hold primacy over population-focused ones. By removing the individual from the centre, this model encourages a move away from the historical and presiding focus on individual-level factors (e.g. cognitive functioning, emotional regulation and genetics) toward those more amenable to public health approaches.

Second, compared with previous models, the schema places an enhanced emphasis on the *interactional nature* of the many influences on child and adolescent development and mental health. These influences are then organised within *interpersonal*, *community* and *institutional* systems, with an appreciation that many might fall across and even outside of these rough delineations. This representation is intended to outline potential targets and settings for public mental health interventions. It further highlights the dependencies and synergies across the wider systems, as an action in one area may set into motion a series of shifts that can lead to changes in a seemingly distant area. This conceptual shift can help move the intervention lens from a siloed approach of singular, contained interventions to one where the depth of interactions and relevant outcomes can be mapped across systems. As such, this conceptualisation can provide a framework for logic models and support the development and evaluation of interventions.

## Evidence review

In the following sections, we use the systems of the interactional public mental health schema to describe the evidence base for public mental health interventions. We define these as interventions delivered outside of specialist mental health settings to promote good and prevent poor mental health outcomes amongst children and adolescents. As a foundation for our reporting, we use findings from four comprehensive and influential systematic and narrative reviews as well as a substantial



**Figure 1** Interactional schema of child and adolescent public mental health

commissioned report from the US National Academies of Science & Medicine, all of which have been published within the last 5 years and cover topics relevant to public mental health: preventive interventions (Arango et al., 2018; Fusar-Poli et al., 2021), school-based interventions (Gee et al., 2020; Werner-Seidler et al., 2021) and general public health interventions to foster good mental health (National Academies of Sciences & Medicine, 2019). To account for more recent innovations, we additionally review findings from a systematic search of three databases for systematic reviews and meta-analyses published in the preceding three years (2020–2022;  $k = 88$ ) (Appendix S1). Finally, we include in each section a ‘modern matter’ facing today’s children and adolescents to highlight examples of areas currently of relevance to public mental health. These have been identified from findings in the OxWell Student Survey of over 40,000 children aged 8–18 years (2021 and 2023) (Mansfield, Geulayov, Soneson, Gallacher, & Fazel, 2022) and refined through consultation with youth advisors (aged 19–22) with experience of mental health research. Despite the overlapping constructs that the studies examine, we present

findings according to the domains of our schema, with an additional ‘school’ domain, as schools lie at the intersection of the interpersonal, community and institutional systems.

### *Interpersonal interventions*

The interpersonal system within our schema comprises the relationships between the child or adolescent and those persons with whom they are most familiar. Within this system, the family is one of the principal intervention targets, as is appropriate given the central role that family plays in the lives of most children and adolescents and the numerous risk and protective factors that exist within this sphere (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010; Hughes et al., 2017; Yap, Pilkington, Ryan, & Jorm, 2014). Peer relationships may also exert a substantial influence on a child’s or adolescent’s mental health and wellbeing (Arseneault, Bowes, & Shakoor, 2010; Lereya, Patalay, & Deighton, 2022; Patalay & Fitzsimons, 2018; van Harmelen et al., 2016); however, as the vast majority of peer-focused interventions operate within the school



setting, these are reported in a later section. The interpersonal system likely has the most evidence of any of the three main domains, with included interventions focused primarily on parenting, prevention of child maltreatment, treatment of parental mental illness and the wider family ecosystem.

Within the family there is strong evidence supporting the effectiveness of parenting interventions for various mental health outcomes including both internalising and externalising problems (Arango et al., 2018; National Academies of Sciences & Medicine, 2019; Yap et al., 2016). These programmes generally target the early years and aim to improve parent–child relationships and build parents' skills by teaching behaviour management techniques. Several notable programmes (e.g. the 'Triple P' Positive Parenting Programme, Parent–Child Interaction Therapy and the Incredible Years) have achieved positive preventive impacts (National Academies of Sciences & Medicine, 2019). Furthermore, recent systematic reviews suggest that they can be delivered using technology-assisted/internet-based models (Floresan, Dobrea, Păsăreanu, Georgescu, & Milea, 2020; Harrison et al., 2022; Nogueira, Canário, Abreu-Lima, Teixeira, & Cruz, 2022), which may make them more accessible for parents and carers from a range of backgrounds and with a variety of needs.

In addition to addressing child behaviour, parenting programmes form an important part of the population-level approach to child maltreatment (MacMillan et al., 2009; National Academies of Sciences & Medicine, 2019). Child maltreatment is sadly not uncommon and has moderate to strong associations with the development of mental health difficulties and disorders (Carr, Duff, & Craddock, 2020; Gilbert et al., 2009). Whilst reducing maltreatment could therefore in theory have substantial positive impacts on child and adolescent mental health (Arango et al., 2018; Lund et al., 2018), evidence in this area is limited, perhaps due to the myriad methodological challenges of evaluating these interventions (MacMillan et al., 2009; Soneson, Das, et al., 2023; Soneson, Puntis, et al., 2023). However, a recent systematic review provides promising evidence, with over half of the included studies of child maltreatment-focused interventions reporting improved mental health outcomes for children and/or their parents or carers (Waid, Cho, & Marsalis, 2022).

Other interventions focus on parental mental illness, another significant risk factor for poor mental health outcomes amongst children and adolescents (Fusar-Poli et al., 2021). Interventions to identify and treat parental mental illness have been well-studied (Arango et al., 2018; National Academies of Sciences & Medicine, 2019), although few have assessed their direct impacts for children (Chapman et al., 2022). From what evidence is available, it seems that treatment of parental mental

illness can reduce internalising, but not externalising, symptoms and reduce the risk of new diagnoses in children by 40% (Siegenthaler, Munder, & Egger, 2012), representing an opportune intervention target for disrupting the intergenerational transmission of mental illness.

Recent reviews have also examined the evidence for interventions that target the broader family ecosystem, with mixed findings. Reviews of interventions targeting families with experience of chronic illness have found some evidence of effectiveness for improving child depression, with limited and mixed evidence for anxiety and post-traumatic stress symptoms (Burley et al., 2022), whilst interventions for children who have lost a sibling have inconclusive evidence (Ridley & Frache, 2020). Studies of family-based interventions to mobilise wider social support – an important protective factor (Viner et al., 2012) – are also inconclusive (Bauer et al., 2021).

*Summary of interpersonal interventions.* In summary, interpersonal interventions in child and adolescent public mental health have generally focused on the family, especially on parents and carers. Strong and consistent evidence exists for the effectiveness of parenting programmes for improving child and adolescent mental health outcomes, whilst emerging evidence supports interventions for vulnerable children and adolescents such as those at-risk for maltreatment, those whose parents have mental illnesses and those affected by chronic illness. Gaps in the literature include interventions targeting the interconnections between children and adolescents and others outside the school environment. These interventions might potentially focus on sibling relationships; the different nuclear and broader family configurations; and friendship, peer and other meaningful child, adolescent and adult interpersonal contexts.

### Community interventions

The role of the neighbourhood and community is likely to vary depending on a number of factors, including the physical area in which a child or adolescent is growing up, the built and natural environment, the sociodemographic context, the level of (in)equality and an infinitely variable set of geo-cultural traditions and practices. The study of communities has been spearheaded by the social sciences including geography, sociology, social anthropology and economics, all of which offer insight that is needed to fully understand the complexity of factors at play and how to measure their impact. Innovative methods that place an increased emphasis on cross-disciplinary study of mental health offer exciting potential to facilitate a more detailed examination of the role that community plays in shaping children's and adolescents'

### Box 1 Modern matters in the interpersonal system: social media and virtual engagement

Despite the near-ubiquitous presence of social media amongst the young population (Odgers & Jensen, 2020), we did not identify any reviews of interventions targeting negative aspects of social media or leveraging its potential as a platform for promoting positive interpersonal interactions. The ever-evolving digital landscape exerts influence over children's and adolescents' social lives and is increasingly a key mode of interpersonal communication when outside school which, for many, is primarily accessed from home. On the one hand, there is concern about how interactions within the online sphere can increase loneliness and adversely affect mental health, for example, through increased opportunities for victimisation and cyberbullying (Hamm et al., 2015), decreased in-person relationships (Odgers & Jensen, 2020) and heightened social comparison (Seabrook, Kern, & Rickard, 2016). On the other hand, positive engagement with social media may, for some, contribute to better mental health outcomes by increasing social connectedness, decreasing loneliness, and facilitating access to social and specialist support (Odgers & Jensen, 2020; Orben, 2020; Seabrook et al., 2016; Twenge, 2020; Valkenburg, Meier, & Beyens, 2022). To date, most studies that have aimed to explore the potential influences of social media on mental health have not accounted for the nuances of how children and adolescents interact with and on these constantly evolving platforms. For example, many studies have used screen time as a proxy for engagement without consideration of the specific activities undertaken (Odgers & Jensen, 2020; Orben, 2020), which substantially limits our understanding about the implications for public mental health interventions in this area. Whilst this leaves many important unanswered questions about the role of social media and virtual engagement in mental health, what is clear is that the virtual world is a substantial part of the lives of children and adolescents which, depending on the context, can be conceptualised both as a target or a tool for implementing public mental health approaches.

lives. Despite the potential reach of community-based interventions, however, compared with the other systems in our schema, there is little evidence regarding their effectiveness for improving mental health outcomes. The intervention areas that have been studied include the natural environment, social cohesion and community-based clubs and activities.

As the global population has become increasingly urbanised, interest in the influence of the built and

natural environment on mental health has accelerated (van der Wal et al., 2021). Recent systematic reviews examining the impact of interventions targeting or set in the natural environment have included a wide range of social and independent activities (e.g. green space activity, gardening and wilderness experiences) across diverse natural settings (Bray, Reece, Sinnett, Martin, & Hayward, 2022; Fyfe-Johnson et al., 2021; Moula, Palmer, & Walshe, 2022). Findings from these reviews have generally supported the effectiveness of these interventions for improving mental health outcomes. Notably, however, evidence regarding the ability of these interventions to prevent the onset of mental health difficulties is limited (Bray et al., 2022; Fyfe-Johnson et al., 2021).

In addition to the physical environment, a community's social environment can have substantial impacts on child and adolescent mental health. Social cohesion – including components such as safety, trust, positive social connections, helping others, and lack of crime and violence – may help protect against the development of mental health difficulties, and intervention studies in this area are an important priority (Breedvelt et al., 2022). Although the academic literature contains relatively few examples of community-based interventions to promote social cohesion or support, there are some noteworthy cases. A recent review of community-led mentoring programmes found evidence that one-to-one support for children and adolescents can have small positive effects on mental wellbeing, internalising behaviours and negative affect (Claro & Perelmiter, 2021). Another example are interventions to improve mental health outcomes by reducing community stigma (Arango et al., 2018). However, whilst there is some evidence that interventions tackling stigma can produce improvements in intermediate outcomes such as attitudinal changes (Ma, Anderson, & Burn, 2023), evidence regarding downstream outcomes (e.g. access to services, mental health) is lacking.

Finally, the community sphere can offer children and adolescents the chance to participate in clubs and activities outside of the school environment. These can be important opportunities for self-expression, socialisation and supporting others. Reviews on this topic have examined arts-based interventions (Moula et al., 2022), group singing (Glew, Simonds, & Williams, 2021) and unstructured play (Lee et al., 2020). However, in general, the studies included in these reviews were of variable quality and rarely measured mental health-related outcomes, so few conclusions could be drawn regarding their effectiveness.

### Summary of community interventions

Although the various aspects of the community a child or adolescent grows up in can have an

**Box 2** Modern matters in the community system: eco-anxiety

Disquiet about environmental degradation and climate change has a long history; however, as the impact of these changes become more prominent, a public mental health approach is required to monitor and respond to the increasing prevalence of so-called 'climate-' or 'eco-anxiety', especially for younger populations. Emerging empirical evidence suggests that the current climate crisis and sustainability concerns may have a negative impact on many children and adolescents (Hickman et al., 2021; Léger-Goodes et al., 2022). Although eco-anxiety is not a psychiatric diagnosis, it can nonetheless cause significant distress and, for some children and adolescents, can be a contributing factor in the development of mental health difficulties. Whilst the primary responsibility for policy change will lie in international and national political arenas, it is important to understand how children and adolescents might engage with these issues in a constructive way that empowers them whilst not placing them at risk. For example, collective social action and activism may offer an outlet for allaying fears as well as promote resilience in the form of agency, hope and social support. There is emerging evidence that collective action may serve as a 'buffer' against adverse mental health outcomes for young adults with eco-anxiety (Schwartz et al., 2022), though it is important to understand outcomes when activism is not perceived to lead to meaningful change. A better understanding of these issues might help address increasing humanitarian and environmental disasters affecting the global community.

important influence on their mental health, the evidence base pertaining to public mental health interventions in this system is limited in terms of both breadth and quality. Whilst there is some evidence to support the effectiveness of interventions targeting the natural and social environment, evidence on pursuing special interests in community-based clubs and organisations is uncertain. Further gaps in the public mental health literature include understanding the potential of interventions to address community violence and neighbourhood disorder (Latham et al., 2022; Lund et al., 2018; Miliuskas et al., 2022), neighbourhood-level socioeconomic deprivation and inequality (Lund et al., 2018; Wilkinson & Pickett, 2019), air and noise pollution (Bernardina Dalla et al., 2022; Chandra et al., 2022; Essers et al., 2022), and scarcity of community spaces (Bell, Foley, Houghton, Maddrell, & Williams, 2018). For some of these there are existing intervention studies that demonstrate

effectiveness for improving intermediate outcomes but have not measured mental health outcomes, highlighting measurement gaps in 'downstream' outcomes (Matjasko et al., 2012).

*Institutional interventions*

Institutions play a key role in public mental health and are the traditional mainstay of public health initiatives more generally. As operationalised in this review, institutions are public social structures and organisations which, through a range of decisions and actions, impact behaviour and the way people live. Specific public health bodies include international and national organisations (e.g. the World Health Organization or the US Centers for Disease Control and Prevention) and, crucially, local public health teams. The roles of these bodies are varied, ranging from on-the-ground commissioning of services and interventions tailored to local need to priority-setting, policymaking, advocacy and regulation. Though initially established to address communicable diseases in the population, their focus on non-communicable diseases (including mental illness) has become increasingly prominent. Importantly, however, the breadth of public targets and interventions (as illustrated in Figure 1's interactional public mental health schema) necessitates action and cooperation across a number of institutions in addition to public health bodies, including health, education, social care, law enforcement and local and national government. Yet the multi-system approach that is needed can – especially in times of austerity – be marginalised and diminished, as institutions might fight shy of the mental health agenda when other areas, such as acute medical care, are also in need (Rocks, Fazel, & Tsiachristas, 2019). This may result in a 'fire-fighting' approach, whereby institutions respond reactively rather than proactively to prevent onset. In the case of mental health, these oversights and service gaps might be best addressed by moving from centralised to decentralised institutions, placing more control in the hands of the local institutions most familiar with the needs of their population (Abimbola, Baatiema, & Bigdeli, 2019). Institutional interventions can help shift this balance to one that emphasises promotion and prevention, either through provision and delivery of interventions and services, examined first, or through policy-making and agenda-setting, discussed second.

In considering services and interventions, health care settings offer a wealth of opportunity to promote positive development and mental health across the lifespan (Hussein, Kai, & Qureshi, 2016; National Academies of Sciences & Medicine, 2019); hence, improving access to these interventions is an important interventions focus. The pre-natal period represents a particularly sensitive window in which to deliver a range of evidence-based interventions,



including promoting infant health and development through nutrition interventions, reducing adverse exposures such as to tobacco or alcohol and building parenting confidence and skills, all of which can contribute to better mental health outcomes (Arango et al., 2018; National Academies of Sciences & Medicine, 2019). Myriad further opportunities exist in the post-natal period. For example, interventions for identifying and treating post-partum depression have received substantial attention (National Academies of Sciences & Medicine, 2019). However, whilst these interventions have good evidence of benefit for mothers, the mental health impacts for children have not been studied sufficiently (Fusar-Poli et al., 2021; National Academies of Sciences & Medicine, 2019).

High-quality health care throughout childhood and adolescence, in combination with community- and school-based supports, offer additional opportunities to promote and protect mental health. In particular, more integrated and holistic approaches between different parts of the health sector (e.g. primary care, community health provision and specialist mental health services) may be beneficial (National Academies of Sciences & Medicine, 2019). For example, children and adolescents with chronic illnesses and/or complex health care needs are a group with higher risk for developing mental health difficulties (National Academies of Sciences & Medicine, 2019; Quittner et al., 2014) who may benefit from additional mental health monitoring and support, potentially including within paediatric services (Boat, Filigno, & Amin, 2017; Fazel et al., 2021; Panagi et al., 2022). Although the evidence base is still nascent, some studies suggest that mental health interventions for these children and adolescents may have some positive effects (Catanzano et al., 2020; Park, Choi, Lee, Park, & Chinbayar, 2022).

Another important area for public mental health action pertains to the accessibility of mental health services. Although the effectiveness of interventions delivered within specialist services falls outside of the remit of the present review, barriers to access and engagement *do* fall within its purview, particularly as those from disadvantaged backgrounds are less likely to access services (Connors, Arora, Resnick, & McKay, 2023). Interventions to improve accessibility are particularly pertinent for children and adolescents, as these younger populations often access support in low numbers and might present late, if at all (Ghafari, Nadi, Bahadivand-Chegini, & Doosti-Irani, 2022; Radez et al., 2020). Furthermore, they might also feel stigma towards or have family members who might not want them to be seen by mental health services because of fears of what such contact might entail in the short-, medium- or long-term (Clement et al., 2015). Recent reviews have explored different modalities of service design and ways to improve and enhance access,

some with promising results. For example, a review of the use of mobile technologies showed that these had durable effects across the age-range for improving access (Conley et al., 2022), whilst another highlighted how single-session psychosocial interventions can address barriers related to help-seeking (Schleider, Mullarkey, & Chacko, 2020).

A second focus of institutional public mental health interventions pertains to policymaking. Outside of health care settings there are several examples of policies and institutional interventions that hold promise for improving mental health, such as policies to improve the quality and availability of childcare and early years education, address poverty and socioeconomic inequality and limit harmful exposures (e.g. alcohol and illicit substances). Unfortunately, however, it seems that many of these policies are not evaluated for mental health impacts, and so whilst they may be effective in tackling a key risk factor (e.g. child maltreatment), the downstream effects on mental health are unclear and merit additional study (Fusar-Poli et al., 2021). Of those that *have* been evaluated for mental health outcomes, most have focused on initiatives to address poverty, income inequality and unemployment, with mixed findings. Recent reviews that have examined the impact of interventions for eligible families to better access income support found small positive or mixed impacts on mental health (Boccia et al., 2023; Burley et al., 2022), and a review of social security policy reforms reported that expansions in the eligibility for benefits were associated with positive mental health impacts (Lorenc, Lester, Sutcliffe, Stansfield, & Thomas, 2020; Simpson, Albani, Bell, Bambra, & Brown, 2021).

Perhaps the most wide-reaching recent policy decision with the potential to impact children's and adolescents' mental health was how to manage education in the Covid-19 pandemic in the context of social distancing (Newlove-Delgado et al., 2022). The difficult decisions taken at the level of national government, as well as those at the local and school levels, shaped how children and adolescents experienced the pandemic, which will have influenced their mental health in various ways. There is some evidence that school closures might have increased rates of anxiety (Chaabane, Doraiswamy, Chaabna, Mamtani, & Cheema, 2021) and that those with greater mental health difficulties before the pandemic were at heightened risk during the lockdown periods (Mansfield et al., 2021). However, there was great heterogeneity in child and adolescent experiences of lockdown, with some even experiencing improved mental health and well-being during this time (Cost et al., 2022; Soneson, Puntis, et al., 2023). Therefore, the longer-term implications of school closures, altered educational and interpersonal experiences, changes in provision of leisure and recreational activities and experiences of social

**Box 3** Modern matters in the institutional system: cannabis

The rising rate of cannabis use amongst adolescents is another area of significant societal change that could benefit from innovative public mental health approaches, both in the context of provision and delivery of preventive interventions and particularly in terms of policymaking. There has been a marked and rapid introduction into the adolescent cultural milieu of high potency cannabinoids via increasingly ubiquitous natural (tetrahydrocannabinol and cannabidiol), synthetic and semi-synthetic cannabis products (Ganesh & D'Souza, 2022), enabled, in part, by an increasingly permissive legal climate in some countries (Hasin & Walsh, 2021; Pacheco-Colón, Ramirez, & Gonzalez, 2019; Skumlien et al., 2021). There is strong, consistent evidence for detrimental effects on cognition (Solmi, 2023) as well as an increased risk of common mental disorders (Hines et al., 2020; Sabet, 2021) and psychotic disorders (Di Forti et al., 2015, 2019) among cannabis users, and with increasing use and potency over recent decades, the population-attributable risk fraction for cannabis use disorders in severe mental illness has markedly increased (Hjorthøj, Posselt, & Nordentoft, 2021). Despite this compelling evidence, these consequences often do not make it into the public discourse (Murray & Hall, 2020). As a result, the development and evaluation of policies addressing legalisation and commercialisation remain limited (de Pablo et al., 2021; Unger, 2022), hence new institutional approaches to address cannabis use are needed (Ballester, Amer, Sánchez-Prieto, & Valero de Vicente, 2021; Hutchison & Russell, 2021; Magalhaes et al., 2020; Solmi, 2023). Whilst interventions focusing on education and behaviour could be important, top-down policies to monitor and restrict access and consumption are likely to be a key component of any effective public health approach to cannabis, as they were for tobacco (Farrelly, Nonnemaker, Davis, & Hussin, 2009; Selph et al., 2020; Vallone et al., 2018).

distancing measures merit continued examination given the wide local, national, and international variation in policy and practice.

**Summary of institutional interventions**

Institutions play a core role in the public mental health arena, and in theory have the highest potential to achieve population-level change. However, our understanding of the value of many theoretically relevant institutional interventions and policies has been hampered by the fact that few evaluations have sufficiently considered or measured mental health

impacts. From the evidence that is available, institutions, especially health care institutions, play an important role in promoting positive development and mental health through the provision and delivery of care that recognise the complex nature of mental health and address barriers to access. Outside of health care settings, policies to improve the economic situation of families might be valuable for improving mental health outcomes, but more evidence is needed. It is also important to acknowledge that there are likely to be many other institutional approaches that may improve child and adolescent mental health that were not captured in this review. The identification and evaluation of these approaches is likely to require innovative methods including better integration of cross-sectoral data and recognition of the complex interaction of risk and protective factors across a range of systems.

**School-based interventions**

One of the natural places to implement public mental health interventions is in schools. Almost all children and adolescents have access to schools, albeit with great variation in size, philosophy, culture, resources and focus (Fazel, Hoagwood, Stephan, & Ford, 2014; Fazel, Patel, Thomas, & Tol, 2014). Those who attend school often spend considerable time there and build important and influential relationships with other students, as well as with adults across pastoral and academic roles. For many, the school also provides a link to the broader community, including other families at school as well as groups for sporting, arts, community engagement and other opportunities for self-expression and connection. There are many school-based risks for poor mental health outcomes that either result from or are exacerbated by interpersonal experiences (such as bullying or peer violence (Arseneault, 2018; Patalay & Fitzsimons, 2018)), school requirements (including start time (Ziporyn et al., 2022) and assessments (Stear, Gutierrez Munoz, Sullivan, and Lewis, 2023)), and wider school climate and environment (Ford et al., 2021; Troy et al., 2022), all of which can exert complex, pervasive and multi-level influences which can best be elucidated through systematic and in-depth measurement.

It is important to consider the unique opportunities a school offers, given the wide range of settings and contexts that can be harnessed. An intervention can be offered by a range of individuals both within and external to the school, during lessons or extracurricular time – the potential targets within structured and unstructured school time are endless. School-based interventions will therefore often include elements of all three systems (i.e. interpersonal, community and institutional). Studies attest to this range of opportunities, the heterogeneity of which can at times overwhelm and thwart any attempt to systematise and synthesise findings.



The majority of innovations described below are from 58 systematic reviews published within the last 3 years. We present findings according to two broad and overlapping areas of interventions: those that focus on and build skills within a child's or adolescent's internal world (drawing on psychotherapeutic approaches) and those that focus on the external world (using the unique elements of the school environment) to protect and promote student mental health. Whilst the internal interventions are more individual-focused than other interventions presented in this review, their potential reach and scalability when implemented within schools make them worthy of consideration for a public mental health approach.

Interventions that focus on developing intrapersonal skills primarily address the individual's thoughts and feelings. These interventions can fit well within a school context, where they can be embedded in lessons, ideally with a participatory pedagogical approach (Scholz, Taylor, & Strelan, 2023). It is therefore no surprise that there have been numerous different attempts to build these intrapersonal skills (Tejada-Gallardo, Blasco-Belled, Torrelles-Nadal, & Alsinet, 2020). The most direct skill-based approaches are built predominantly on classroom-taught cognitive-behavioural and mindfulness-based strategies. Several comprehensive reviews have examined the effectiveness of these interventions, as both promotion and prevention strategies (Werner-Seidler et al., 2021; Dunning et al., 2022; Phan et al., 2022). Interventions concerning emotional regulation, psychological first aid and self-compassion are amongst the myriad other intrapersonal interventions that have been trialled in schools (Table S1). In general, it seems there is a small effect, primarily in cognitive-behavioural approaches as compared with mindfulness-based interventions, in preventing anxiety and depression, which when translated to a whole population are likely to have notable impacts (Werner-Seidler et al., 2021). There is particularly good short-term evidence for indicated prevention interventions, but few studies have examined medium- and long-term outcomes (Gee et al., 2020).

Whilst most school-based prevention interventions have focused on depression and anxiety, some have targeted subclinical symptoms and possible indicators of less common disorders, including post-traumatic stress disorder and eating disorders. Whilst these disorders often fall under more clinical interventions, there is some evidence that public mental health interventions may also be beneficial to prevent their onset. For example, one systematic review found small-to-moderate effects of school-based interventions for children exhibiting symptoms of post-traumatic stress (du Mello Kenyon & Schirmer, 2020), whilst another concluded that multi-session universal interventions delivered by teachers are likely to have a positive impact on body

dissatisfaction and self-esteem, particularly for girls (Chua, Tam, & Shorey, 2020).

Another area of substantial focus within school-based public mental health interventions has been on high-risk behaviours or presentations known to be associated with poor mental health outcomes, often focusing on intrapersonal and interpersonal skills. The most studied within school settings relate to self-harm and prevention of substance misuse (National Academies of Sciences & Medicine, 2019). Most of the included reviews of interventions for self-harm and suicide prevention showed a small but sustained effect on mental health outcomes, with universal approaches having the best emerging evidence base (Brann, Baker, Smith-Millman, Watt, & DiOrio, 2021; Breet, Matooane, Tomlinson, & Bantjes, 2021; Gijzen, Rasing, Creemers, Engels, & Smit, 2022; Walsh, McMahon, & Herring, 2022). Conversely, whilst there are many different interventions to address substance misuse in schools, few have specifically assessed mental health outcomes (National Academies of Sciences & Medicine, 2019).

In the broader context of wellbeing, there have been a number of reviews examining more general interventions, such as promoting 'positive psychology' (with an emphasis on the influences in a young person's life that might help them thrive), building problem-solving skills and teaching about ways to reduce stress. Cilar, Stiglic, Kmetec, Barr, and Pajnkihar (2020) have highlighted how about half of such studies on school-based wellbeing interventions have achieved some success in terms of emotional wellbeing outcomes.

Public mental health interventions within the wider school environment are those that aim to improve school climate or provide opportunities to enable children and adolescents to participate in activities that might improve their mental health. Prominent examples include interventions that facilitate supportive social relationships, primarily between peers. These interventions may have a range of goals, for example, to reduce peer victimisation and bullying or to build feelings of school belonging. The mental health impacts of anti-bullying interventions have been examined in a number of recent systematic reviews, most notably those led by Guzman-Holst, Zaneva, Chessell, Creswell, and Bowes (2022) and Fraguas et al. (2021), both of which concluded that the small positive effects observed are likely to translate into meaningful population benefits.

Mentorship within schools, and particularly peer mentorship, is another common approach for addressing a range of needs including mental health. For peer mentorship, positive mental health impacts are primarily observed for the individual chosen to be the mentor rather than for the mentee (King & Fazel, 2021), although there might be some small effects for other forms of mentorship within the school setting (Claro & Perelmiter, 2021). Studies of friendship interventions have limited evidence of

mental health benefit (Manchanda, Fazel, & Stein, 2023). Other interventions for the school environment, such as those to improve school transition (Donaldson, Moore, & Hawkins, 2023) or provide more support for academic needs through organisational or individual-level approaches (Fishstrom et al., 2022; Troy et al., 2022), have unclear mental health impacts.

The physical environment of the school can also contribute to opportunities to interact and build a sense of connectedness. ‘Greening’ of school outdoor space and opportunities to play during the school day have both had positive impacts on mental health outcomes (Bikomeye, Balza, & Beyer, 2021; Burson & Castelli, 2022). The physical school environment can also facilitate physical activity, which has been the target of a host of interventions. Reviews examining the mental health impacts of physical activity interventions provide good evidence to support incorporating physical activity into the school day (Carter, Bastounis, Guo, & Jane Morrell, 2019; Hale, Colquhoun, Lancaster, Lewis, & Tyson, 2023; Leahy et al., 2020; Wang et al., 2022).

*Summary of school-based interventions:* The 58 recent systematic reviews conducted on school-based public mental health interventions showcase the broad range of potential interventions, which can be divided into those that address the internal world of the child or adolescent and those that focus more on what the external environment can enable. In distilling the main themes that emerged, it appears that many school-based interventions, particularly those based on cognitive-behavioural principles, have achieved some success, although the magnitude and durability of their effects is less clear. Interventions focused on the school environment, such as anti-bullying interventions, demonstrate how a school-wide approach to key risk factors might lead to substantial benefit at a population level. Taken together, these findings highlight how moving to a multi-level systemic approach that includes both internal and external elements might better address student mental health needs.

## Discussion

Public mental health interventions, spanning the interpersonal, community and institutional ingredients of society, are an essential part of the wider approach to child and adolescent mental health. From our evidence review, the most consistent evidence was for interventions that targeted parenting skills and the child–parent relationship in the interpersonal system; the natural and social environments in the community system; accessible life course and integrated health care in the institutional system; and intrapersonal skills, antibullying interventions and physical activity in the school system. However, there is still room for innovation, with

## Box 4 Modern matters in the school system: academic pressure

Despite an absence of any recent reviews on interventions targeting academic stress and pressure, many children and adolescents report stressors from the education system including ‘fear of failure, concerns about the future, chronic stress about workload and exams, worries about parental expectations, and competition with peers for grades’ (Stear et al., 2023). Furthermore, there is evidence that academic pressure, a complex construct that is influenced by individual and family perspectives but also invokes school leadership, policy directives and the school inspection system, might be on the rise (Löfstedt et al., 2020). In many countries the emphasis is on a ‘one-size-fits-all’ focus on individuals achieving top marks in public examinations rather than encouraging student accomplishment in areas best aligned with their interests and skill set, be that in academic, athletic, creative, community engagement or other arenas. Although further evidence is required to understand whether there is a causal relationship between school-based pressure and mental health difficulties (Stear et al., 2023), it is reasonable to suggest that these academic pressures could be an important target for public mental health approaches. Schools may be a natural place to address this, including through policies and approaches that emphasise, in addition to academic attainment, the importance of domains such as school climate, interpersonal relationships and extracurricular activities. Finally, with the marked changes that the introduction of generative artificial intelligence (AI) will bring to education (Lim, Gunasekara, Pallant, Pallant, & Pechenkina, 2023), we are at a watershed moment where the fundamentals of school learning and assessment are being reshaped in ways that will impact on the entire student experience. This could be both positive and negative; for example, generative AI might be able to promote more equitable access to tailored educational opportunities but could also increase emphasis on high-stakes, in-person assessments at a time where progress has been made in de-emphasising traditional metrics of academic attainment. These potential differential effects of generative AI on student experience will undoubtedly have knock-on effects on perceptions of academic pressure.

underdeveloped evidence regarding some of the most important contemporary societal issues today’s children and adolescents face. These ‘modern matters’ (Boxes 1–4), ranging from climate uncertainty to rapidly-evolving virtual environments, might have an impact on child and adolescent mental health. Not

only is there an absence in understanding the role of broader co- and extra-curricular activities in students' mental health but it may be that participation in the creative arts or engagement with broader social needs through positions of responsibility, volunteering projects, or participating in social campaigns may also have positive mental health impacts. If these are not evaluated, then their potential importance for children and adolescents remains unclear.

### *Future directions in public mental health*

*Interactional approaches.* In order to understand and unpick the multitude of modern-day influences on child and adolescent mental health and identify targets for interventions, we must complement traditional methods of individual-centred genotyping and phenotyping with deep and frequent interpersonal and environmental phenotyping. In other words, we argue that progress in this field requires more intensive and systematic observation and characterisation of the complex and dynamic social and physical worlds children and adolescents inhabit. Although the multifaceted nature of risk and resilience in child and adolescent mental health is now widely acknowledged (Fried & Robinaugh, 2020; Lo Moro, Sonesson, Jones, & Galante, 2020; Lund et al., 2018; Patel et al., 2018; Viner et al., 2012), the development and evaluation of interventions that take this complexity into account have lagged behind, instead falling into the trap of siloed thought and action. Until we can understand and take advantage of the multifactorial and interactional nature of the various systems in which children and adolescents live, we are unlikely to progress beyond the modest and often short-term effects demonstrated by many of the interventions included in our evidence review. As articulated by Fried and Robinaugh (2020) in their argument for a systems approach in mental health, 'Embracing complexity presents both an unparalleled challenge and, simultaneously, an enormous opportunity to advance our understanding of mental disorders and our ability to support those who suffer from them'.

Perhaps most notably, a truly holistic public mental health approach requires tackling the wider societal issues that have ramifications across all arenas of a child or adolescent's life. Many children and adolescents grow up in a world plagued by pervasive and interacting upstream issues that, if not addressed, significantly limit the potential impacts of possible interventions. Manifestations of a fraying social fabric including poverty (Marmot, 2020), socioeconomic inequality (Wilkinson & Pickett, 2019), violence (Bentivegna & Patalay, 2022; Latham et al., 2022) and discrimination (Cave, Cooper, Zubrick, & Shepherd, 2020) contribute substantially to the risk of developing mental health

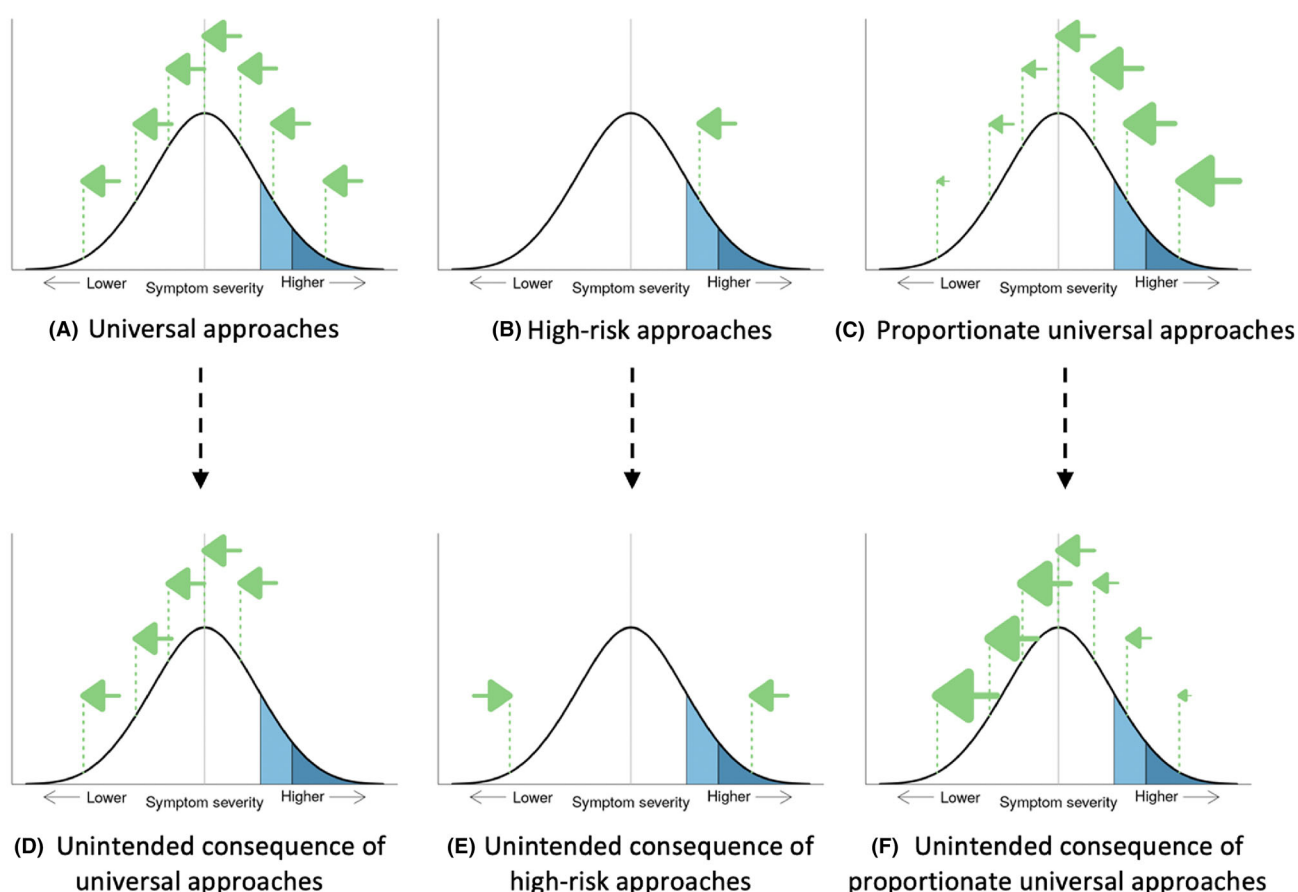
difficulties and disorders, and should be foremost targets within public mental health enquiry. However, there are a plethora of barriers to developing, evaluating and implementing relevant approaches, including unreceptive political environments, limitations in short-term funding schemes and hurdles in how to measure and collect the most pertinent outcomes over time.

*Incorporating the child and adolescent perspective.* The study of most interventions in child and adolescent health have had limited involvement of young people in most stages of the study cycle, from intervention design to analysis and interpretation (Sellars, Pavarini, Michelson, Creswell, & Fazel, 2020), an omission echoed in recent systematic reviews. There have been recent shifts in this landscape, with increasing appreciation of the potential role and benefits representative populations, with and without lived experience of mental health difficulties, can play in co-production. Co-production has the potential to improve interventions from their targets and impact to future implementation. For example, empowering young people in participatory action approaches has been of value in substance use prevention (Maina et al., 2020) by making the interventions aesthetically engaging and ensuring the content reflected their realities. Furthermore, co-production is likely to be important in making interventions acceptable to young people across diverse cultural contexts (Grande et al., 2022).

*Deliberate design and analysis with a population focus.* The broad range of public mental health innovations discussed manifests how interventions can target child and adolescent populations in different ways, and more precise definitions of aims and target populations could enable better evaluation and implementation. In Figure 2, different intervention aims are presented, as seen across the reviews. Broadly, interventions aimed to target (A) all children and adolescents equally (universal approaches), (B) those at 'high risk' for developing mental illness but who do not have a diagnosable disorder (comprising selective and indicated interventions) or (C) all children and adolescents but with differential focus, increasing as risk increases (proportionate universal approaches).

However, issues of design and implementation often impede interventions from reaching their intended target populations. For example, plot (D) represents what can happen if the barriers to participation and engagement for the highest risk populations are not carefully considered within universal interventions. Meanwhile, plot (E) illustrates a possible unintended consequence of the high-risk approach, which is that, in a system with finite resources, focusing on those at highest risk necessitates withdrawing resources from others. Finally, plot (F) demonstrates a potential paradoxical





**Figure 2** Examples of the aims of different public mental health interventions (A–C) and potential unintended consequences (D–F). The positioning of the arrows indicates which part of the population an intervention *aims* to target (top row) or *actually* targets (bottom row). Arrow direction represents the intended or actual shift in the population (with arrows pointing left representing a move towards lower symptom severity) and arrow size represents the relative focus/amount of resource allocated to a particular part of the population (with larger arrows representing greater focus/resource allocation). (A) Universal approaches aiming to target all children and adolescents equally. (B) High-risk approaches (including selective and indicated approaches) aiming to target children and adolescents with increased risk for developing mental health difficulties. (C) Proportionate universal approaches aiming to target all children but with greater focus as risk increases. (D) An unintended consequence whereby the intervention is not accessible to those with the highest risk. (E) An unintended consequence whereby resources are only made available for those at highest risk, potentially creating new problems for others. (F) An unintended consequence whereby the greatest benefits are for those at lowest risk

effect whereby an intervention designed to primarily benefit the highest risk, most benefits those at lowest risk (King & Fazel, 2021; Montero-Marín et al., 2022). The potential for unintended consequences needs, therefore, to be carefully considered and measured within public mental health research (Bonell, Jamal, Melendez-Torres, & Cummins, 2015). School-based mindfulness interventions are a good example of this potential, as, despite their widespread implementation in some countries, they may actually be contraindicated for students with higher levels of mental health difficulties (Montero-Marín et al., 2022). This example illustrates the danger that public mental health interventions might ‘run ahead of the evidence’ (Dunning et al., 2022), whereby they are prematurely rolled out with insufficient evidence.

Implementation science is crucial for understanding how to best scale up effective public mental health interventions. Whilst this field is gaining momentum, many of its cornerstone constructs are yet to be fully utilised (Brownson, Shelton, Geng, &

Glasgow, 2022), including intervention acceptability, accessibility and scalability. Those evaluating public mental health interventions should be mindful that data will often be missing on those who do not participate (out of choice or circumstance), especially if they fall into a higher risk group. This limitation may have implications for determining whether and how to scale up an intervention, as well as for the resulting population-level impacts.

Another methodological difficulty in assessing the evidence base for public mental health interventions, for both reviews and primary studies examined, was a discordance between the purported aims of interventions and the methods used to assess outcomes. For example, many studies that claimed to examine a preventive intervention reported findings in terms of changes across entire populations *including those with mental illness at baseline*. In other words, these studies did not consider the *incidence* of mental illness, which is necessary for understanding the effectiveness of truly preventive interventions

(Fusar-Poli et al., 2021). We have previously discussed these issues elsewhere (Fazel & Korht, 2019) and highlighted methodological considerations in the context of analysing school-based mental health interventions. In that commentary, we noted the importance of being deliberate about analyses, and ensuring that conclusions drawn about the ability of interventions to *prevent* mental illness are based on suitable study design and analytical methods.

Considering outcomes from a population-level perspective can address some of these issues and provide much-needed insight into the public health potential of mental health interventions for children and adolescents. This may be facilitated by mapping outcome distributions, yet most studies measure effectiveness in terms of point estimates, thereby limiting the understanding of differential population-level effects. In Figure 3, we present some examples of possible theoretical population-level effects that could be seen in public mental health interventions.

The first tier of intervention effects represents interventions with a population-level universal benefit for mental health difficulties and disorders. Plot (A) shows the traditional 'shifting the curve' effect laid out in Rose's *Strategy for Preventive Medicine* (Rose, Khaw, & Marmot, 2008). Rose theorised that 'a large number of people exposed to a small risk may generate many more cases than a small number exposed to a high risk' (p. 59), suggesting that public health strategies to improve health on a population level might be more effective than targeting only individuals at the highest risk for poor health outcomes. It is important to note, however, that apart from some limited evidence (Lo Moro et al., 2020), the applicability of this theory to mental health remains unclear (Mehta, Croudace, & Davies, 2015). A related effect would be the elusive 'magic bullet' effect (plot (B)) whereby the distribution not only shifts, but narrows, such that it creates a 'thriving' effect whereby the variance is decreased and all children and adolescents experience improved mental health. Plot (C) illustrates a different example of a population-level universal benefit, with more prominent effects for those at highest risk but a smaller positive 'knock-on' effect for those at low-to-medium risk.

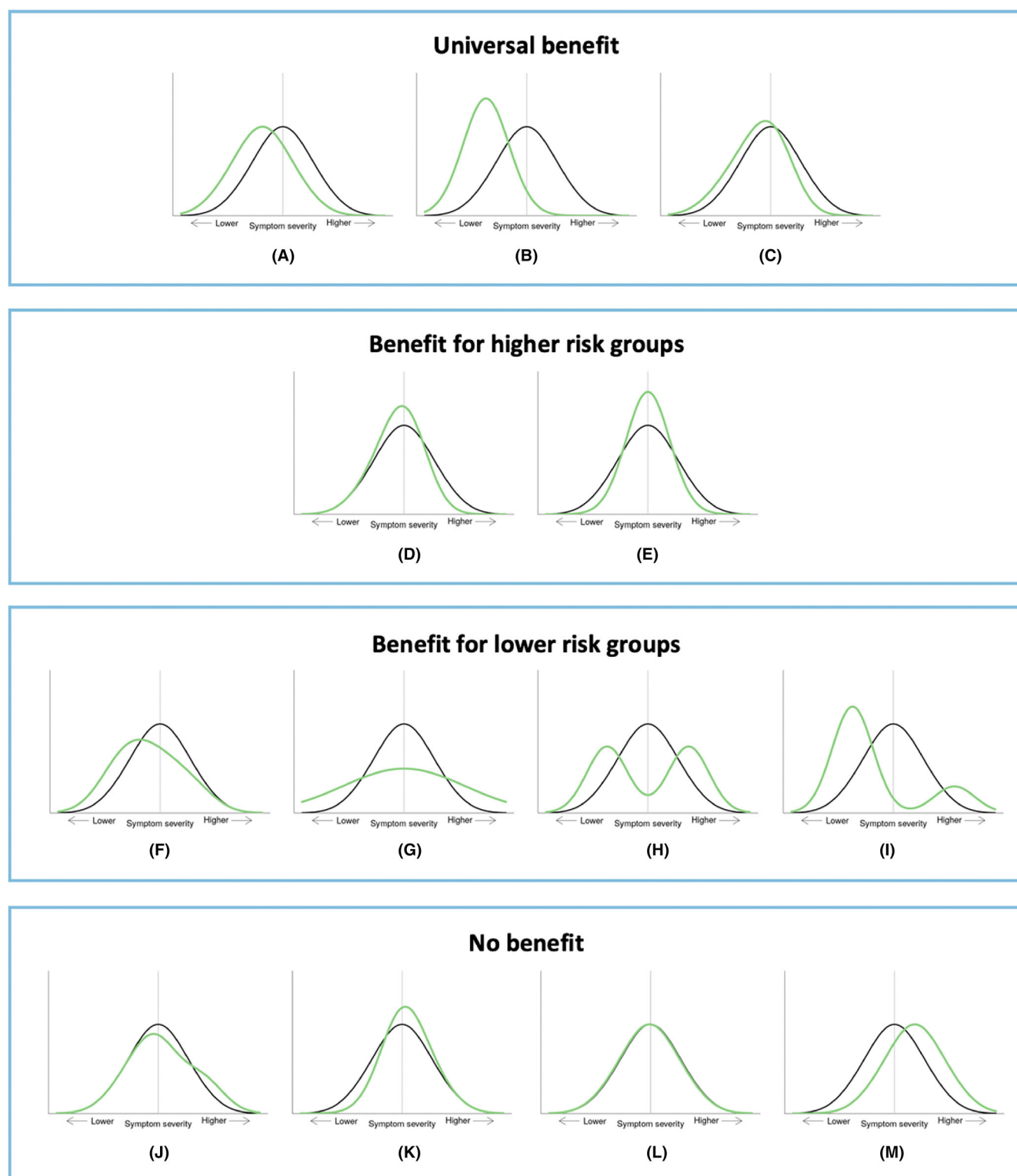
The second and third tiers of potential intervention effects pertain to interventions that have differential population-level effects (i.e. benefits for some groups but not others). The second tier represents interventions that benefit those at highest risk but have null (plot (D)) or adverse (plot (E)) effects for those at low-to-medium risk – particularly interesting as it represents a kind of 'homogenising' impact, where some experience an iatrogenic intervention effect. The third tier interventions benefit those at low-to-medium risk but have null (plot (F)) or adverse (plots (G–I)) effects for those at high risk. This reflects a concern that public mental health interventions could widen disparities (Bonell et al., 2015; McGrath et al., 2021) by primarily benefiting those with the

least need (although, as Bonell et al. note, inequity may also arise from interventions that benefit all, but disproportionately so).

The fourth tier of potential intervention effects represents interventions where there are no population-level benefits. Plots (J) and (K) represent differential effects. These may result from interventions where those at medium-to-high risk experience iatrogenic effects and those at low risk experience null effects (plot (J)) or where these are reversed (plot (K)). The final two plots demonstrate the impact of interventions with homogenous population-level effects, including universal null effects (plot (L)) and universal iatrogenic/harmful effects (plot (M)). The plots in this tier represent the importance of considering the potential for adverse impacts from the start of intervention design to ensure that the evaluation process is able to measure all these potential effects (Bonell et al., 2015).

In summary, to maximise our understanding of the population-level impacts and potential mechanisms of public mental health interventions for children and adolescents, it is crucial that we are deliberate in study design and analysis. This will include being explicit about interventions *aims* (Figure 2) as well as more precisely assessing their effects at a population level (e.g. Figure 3; see Galante et al. (2018) for an empirical example), with a focus throughout on the possibility for null or even iatrogenic effects. This may be particularly important for those at higher risk of developing mental health difficulties or for whom interventions are less accessible, such as those from sexual and gender minority groups, neurodivergent populations, incarcerated adolescents, those not in education, minoritised ethnic groups and those who have experienced upheaval and forced displacement due to natural or man-made disasters and crises. Furthermore, what is considered a 'good' aim or which population-level impact is prioritised is often subjective, variably based on individual or community values, influenced by popular, religious or secular trends and prone to behavioural, cognitive and emotional biases.

**Measuring mental health.** Designing effective public mental health interventions requires a nuanced understanding of the complex interactional systems a child or adolescent inhabits. To better identify intervention targets, public health approaches need to encourage a new age of study design that enables enriched enquiry into young lives. Longitudinal cohort designs that are hyper-focused on the individual, whilst invaluable in the examination and discovery of molecular biological determinants and single causal factors in other areas of health, will likely not be able to account for the depth of interactions a systems approach demands. Rather, it is probable that many fundamental questions in mental health can only be answered when the lens of enquiry moves to more extensively examine the multitude of



**Figure 3** Theoretical population-level effects of public mental health interventions. Distributions in black represent pre-intervention symptom severity and in green represent post-intervention symptom severity. (A–C) Interventions with universal population-level universal benefit. (D, E) Interventions that have benefits at the higher-severity end of the population distribution, with null or iatrogenic effects at the lower-severity end. (F–I) Interventions that have benefits at the lower-severity end of the population distribution, with null or iatrogenic effects at the higher-severity end. (JIM) interventions that have no population-level benefit, with null or iatrogenic effects across the severity distribution

interacting factors in the life of a developing child and adolescent. Measuring, or ‘phenotyping’, interpersonal and environmental factors might require refining and/or developing methodology to better incorporate in-depth anthropological, political,

economic, geographical, sociological and technological lenses to help shift the focus of study from the individual to their wider context, with relevant and related structures and players receiving increased attention.



It is also important to consider how to measure mental health outcomes within evaluations. In reviewing the literature, many interventions addressing key risk factors did not measure any mental health outcomes. There is an argument to be made that when risk factors fulfil the criteria to establish causation, measuring the downstream impacts might not be necessary (Wilkinson & Pickett, 2019). However, such evidence is not as forthcoming in the field of mental health as it is in other fields (Fusar-Poli et al., 2021). Therefore, when mental health outcomes are not measured (e.g. when interventions to reduce community violence include incidents of violence as the obvious outcome, but do not assess mental health), potentially valuable information on impact is lost. There are many pragmatic reasons why these outcomes might not have been measured, for example, to guard against overburdening participants or due to financial and time-bound constraints. However, recent innovations may ease this burden by simplifying data collection and/or improving access to data already collected on mental health outcomes. For example, computerised adaptive testing can enable more efficient assessment by reducing the number of questions needed (Stochl, Ford, Perez, & Jones, 2021), whilst administrative record linkage can facilitate integration of cross-sector data that supports a broader lens within child and adolescent mental health (Ford et al., 2021). Finally, better access to existing data encouraged by open science philosophies and federated models of access through secure servers further removes barriers to research and democratises data access (Toga et al., 2023) – a principle young people have highlighted as important in the curation of their data (Sieberts et al., 2023). With further research integration across the applied and social sciences, the tools for in-depth exploration of meaning and location will extend the lens of both quantitative and qualitative enquiry through, for example, the art of anthropological ethnography, the frameworks of hard and soft infrastructure examined in political science, the measurement of quality of life in economics and the investigation of interrelationships in physical and human geography.

We are therefore at an exciting moment of transition that has potential to bring public mental health to the fore. Opportunities for better understanding how to improve child and adolescent mental health outcomes are gaining unprecedented momentum, with innovative new methodology, evolved technology, heightened public awareness, institutional interest and funding availability to enable more nuanced intervention design and evaluation that does not shy away from complexity.

## Concluding remarks

A public mental health focus is needed to incorporate the dynamic interpersonal, community and

institutional ingredients inherent in the human life-cycle, especially in the formative developmental stages of childhood and adolescence. Furthermore, scaling up the impacts of any positive findings in public mental health interventions will often rely on policy-directives, thus making public mental health inherently political. This research review has presented some key arenas of public mental health interventions that have started to build an evidence base, cognizant that current research structures and funding mechanisms do not necessarily enable the multidimensional, interdisciplinary and conceptually responsive lenses needed to inform the range of interventions that could potentially be tested. No matter what advances are made in individual psychotherapeutic and pharmacological approaches, the focus must also encompass methods that better capture the interconnected and rapidly evolving worlds in which today's children and adolescents interact.

## Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article:

**Appendix S1.** Search methods.

**Table S1.** Table of included systematic reviews and meta-analyses from 2020 to 2022.

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## Key points

- Greater focus on the complex interactions between the interpersonal, community and institutional systems in which a child or adolescent lives can help enable a deeper and more nuanced understanding of the possible targets and impacts of public mental health interventions.
- Many public mental health interventions – particularly within the interpersonal and school spheres – have evidence of small-to-moderate benefits for child and adolescent mental health outcomes; however, few sustained impacts have been documented.
- Policy levers are likely to be powerful tools in the public mental health arena, yet for a multitude of reasons are understudied. These approaches deserve additional attention and evaluation.
- Groups who are at higher risk of developing mental health difficulties or for whom interventions are less accessible merit special consideration in the design and evaluation of public mental health interventions.
- Public mental health approaches may benefit from more deliberate population-level design and evaluation as well as measurement that embraces complexity through in-depth interpersonal and environmental phenotyping.

## Data availability

All data included in [Supporting Information](#).

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