Caring Futures Institute

Creating better lives through research

Addressing the gaps in health for children

Innovative Health Service Delivery:
Enhancing lifelong development, health and wellbeing for marginalised children 0 – 18 years.

ISBN: 978-1-925562-40-8

Flinders UNIVERSITY

22% of all children in Australian live in housing instability. We have no idea of their health, wellbeing or health needs.

Key findings to date from the Nurse Practitioners

Evaluation of the Nurse Practitioner-led services found that children presented with various severity level medical conditions. The conditions identified were coded using a scale of severe =3 (needing immediate care/intervention), moderate =2 (needing a referral but can wait for public hospital/clinic), minor = 1 (does not need immediate referral). Overall numbers showed that 62% had severe health conditions (e.g. chronic dental caries, craniosynostosis with developmental delay) requiring interventions, while 38% of children who were assessed to be in good health requiring no intervention.

- All children were disconnected from mainstream health services,
- Families indicated they decreased use of Emergency Departments
- The service is cost effective as the average cost of an ED presentation is $666 [IHPA 2020], compared to $96 per hour for a NP, or GP at $168.24* (per hour for Medicare Rebate only, most GP charge additional gap fees over and above the Medicare fee).

Executive Summary

The Department of Health, Action Plan for Children and Young People states 22% of all children in Australia aged 0-14 years live in housing instability. Exposure to housing instability in childhood is significantly linked to long term ill-health, lower academic achievement, increased poor health physically and mentally, and increased risk of adult homelessness. Housing instability has created detrimental under-servicing for children at a time when they are developmentally vulnerable. Despite previous research in this area stating that children who are disconnected from health, education and social activities normally associated with childhood and appropriate child developmental have lifelong detrimental health and well-being outcomes, little has been done to address this deficit. This report details the outcomes of a pilot health services delivery model and practice that actively addresses the current health system deficits for children living in housing instability through a Nurse Practitioner (NP)-led clinic. Inner Southern Homeless Service provided a Nurse Practitioner-led clinic service for all homeless families with children from Dec 2019 to Oct 2020. The employed Nurse Practitioner was paediatric Emergency Department endorsed NP.

The Nurse Practitioner provided each child with a comprehensive health assessment using standardised tools, partnered with the families to develop referral and care access plans encompassing the health, social and educational needs of the child, and assisted the, to navigate the barriers to referral compliance. These barriers can include lack of transport (addressed here through vouchers or NGO fleet use), access to primary health care, (addressed through access to Bulk Billing General Practitioners and Medical Specialists) and liaising directly with schools.

There is a clear opportunity here to provide early, cost effective intervention to help families reconnect with health, housing and community through a Nurse Practitioner-led model of care. This could help stem the tide of children, families and young people who are homeless or living in poverty from increased high levels of ill-health and health care costs.

Characteristics of the Service

This innovative model of health services delivery provided the following unique aspects of care using an Embedded Nurse Practitioner -led model of care that was:

- Explicitly child focused
- Comprehensive and in-depth in providing child assessments
- Diligent in providing extended referral support and follow up with medical, educational and welfare services
- Targeted appropriately at child focused primary care, thus reducing attendance at emergency departments for primary care.

Population Served

The health and welfare characteristics of the children aged 7 weeks to 16 years, attending the Nurse Practitioner (NP) led health clinic at Inner Southern Homelessness Service were:

- Overall, 24% of all children presented had severe health conditions requiring an immediate response
- 18% had moderate health conditions requiring a timely response
- A further 22% presented with conditions that required treatment and interventions by the NP
- Overall low immunisation rates (6% fully immunised)
- High rates of ill-health in children (62%)
- High rates of home visiting (NP provide 86% of families- a possible COVID-19 impact)
- 22% identified as Aboriginal or Torres Strait Islander

The overall intake of clients in the Inner Southern Homelessness service for this period was 612, with 22% of the children using the NP service identifying as Aboriginal and Torres Strait Islander, and of the clients using ISHS, 29% aged 0 to 16 years old. All children referred to the Nurse Practitioner (NP) service received a comprehensive and in-depth health assessment.

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Identified Areas For Consideration

- A significant number of children required medical intervention.
- Children living in housing insecurity are at risk of missing out on care that is essential to their development and health
- These children lack access to mainstream services
- Health care costs act as a barrier to services
- There is a poor referral uptake by children living in housing insecurity
- Lack of information on the number of homeless children, particularly Aboriginal children

Current Health Systems Barriers

The list below outlines the current health system barriers that inhibit the expansion of this program:

- Referral pathway barriers in hospitals cause delays in treatment despite the severity of conditions
- Lack of referral follow up in current acute care services exacerbates these delays for children in need in the receiving of care
- There is a lack of adequate remuneration for Nurse Practitioners in this role ($16-20 per hour)
- There is a lack of response from the public hospital sector for children with developmental delay

The use of Nurse Practitioners-led services embedded within the Homelessness Services is ideally situated to undertake this cost-effective innovative model of health service delivery. Nurse Practitioner models of care use a combination of nursing care, diagnostic activities, and intervention-based treatments, including the use of medicines (Woo, Lee & Tam 2017; Jennings et al. 2015) to address vulnerable children's needs.

Recommendations From This Research

- Immediate funding for embedding of child focused NP-led services into all homelessness services
- Expansion of the Medicare rebate and item numbers to Nurse Practitioners to included in-depth assessments, referral tasks, and appointment support and follow-up.
- Extended referral follow-up is key to the success of appointment use, compliance and this model of service delivery
- Used of extended transport and appointment support by the NP and the service provider e.g. UCWB.

Introduction

Australia has a growing problem with homelessness, due to rising rates of poverty and under or unemployment (Pawson et al 2018). Children aged 0-14 years make up 22% of the Australian population living in housing instability (DHA 2020). The delay for children in obtaining access to health care due to housing instability is costly. The late action in addressing preventable child developmental interventions costs Australia $15 bn per year (Hall et al 2020). Effective early healthcare interventions for children result in significant cost savings (Teager, Fox & Stafford 2019). Ad hoc care, such as Emergency Department use, during childhood can result in inconsistent, inappropriate and detrimentally longer-term health outcomes. The cost of ED care is increasing each year (IHPA 2020). Emergency only care can result in missed immunisation, physical, cognitive and behavioural developmental impairment and failure to meet milestones, often a result of families missing educational and health appointments (American Academy of Paediatrics 2013; Long et al. 2018; Parry et al. 2020; Kubicek et al. 2012; Rutter et al. 2017; Lau et al 2016; Pennsylvania Chapter of the American Academy of Paediatrics 2014; Department of Health 2018). Additionally, this use of Emergency Departments can impact on the sustainability of publicly provided healthcare (Hudson et al 2014; Neuman 2014; AIHW 2018; Long et al 2018).

Defining homelessness

H2H and the Australian Institute of Health and Welfare (AIHW) define a person as at risk of homelessness if they are at risk of losing their accommodation or they experience one or more of a range of factors or triggers that can contribute to homelessness (Sivertsen et al 2020). The most common risk factor is housing affordability stress or housing crisis (pending evictions/foreclosures, rental and/or mortgage arrears), followed by inadequate or inappropriate dwelling conditions, including unsafe, unsuitable or overcrowded accommodation (Parry 2014; Parry et al 2020; Flavel and Freeman 2020).

Social Health Service agencies collect clients' main reason for seeking support at the start of support. The main reason given by clients experiencing homelessness in Adelaide who accessed SHS services in 2018-19 included housing crisis (e.g. eviction) (49 per cent), an inadequate or inappropriate dwelling (18 per cent), domestic and family violence (10 per cent), itinerant (7 per cent) and previous accommodation ended (6 per cent) (Flavel and Freeman 2020). These responses indicate that housing instability arises from a range of situations and demonstrates that housing is a central need for families. The most prevalent reason for eviction was underemployment or unemployment of the parents (Flavel and Freeman 2020). Housing instability places children at high risk of ill-health and unmet health needs (Parry, Grant and Burke 2015a; 2015b; Parry et al 2020).

Child health and housing instability

In 2020 COVID-19 has highlighted the privilege for children of having a 'home' to shelter in and stay safe (Coughlin et al 2020). The relationship between housing and child health is bi-directional; as housing instability increases so does the risk of increased morbidity and mortality for children (Parry et al 2020; Coughlin et al 2020; American Academy of Pediatrics 2013). The impact of childhood poverty and adversity on the developing children are well known (Parry et al 2020; Wijeakumar et al 2020; Halton et al 2020). These patterns of increased childhood mortality and morbidity are evident in children well before aged 5 years (Wijeakumar et al 2020; Halton et al 2020).

Health access and homelessness families:

Children in families living with homeless or housing instability lack connections to developmentally appropriate primary health care (Sivertsen 2020). Current forms of health care access do not adequately meet the needs of children in families who experience homelessness increasing the prevalence of accumulative harm and long-term deleterious health outcomes (Sivertsen 2020). Referral uptake and appointment compliance is one of the greatest barriers for children living in homeless families. Direct referral support for children can provide improvements in physical and mental health, and behaviour.

The Nurse Practitioner-Led Homeless Health Service innovation

Inner Southern Homeless Service (ISHS), in conjunction with Flinders University introduced a Nurse-Practitioner-led health service for the children of parents in housing insecurity to specifically address the health needs of these children. A key component of this project, was the partnership the Nurse Practitioner developed with the families to develop referral and care access plans encompassing the health, social and educational needs of the child. The NP assisted the family to navigate the barriers to referral compliance. These barriers can include transport (addressed here through vouchers or NGO fleet use), access to primary health care, (addressed through collaborations with Bulk Billing General Practitioners, and Medical Specialists), and liaising directly with schools. Nurse Practitioners are Medicare funded for:

- limited or 'straightforward' health assessments (82200). Involving limited examination and management
- 20 minutes assessments including referral and a management plan with preventative health care (82205)
- 40 minute extensive history and clinical examination (82215)
- Telehealth 82220, 82221, 82222 for NP in rural and remote areas only

Unlike GPs the NP can only claim for one Medicare item per appointment or visits. The extensive referrals, referral support, history and clinical examination required by these children to address their complex family and health needs is not funded but was a crucial part of this research and the services provided. Addressing the missing gap in current health services which places the children at risk of costly, lifelong ill-health (American Academy of Paediatrics 2013; Long et al. 2018; Parry 2014; Parry et al. 2020; Kubicek et al. 2012; Rutter et al. 2017; Lau et al 2016; Pennsylvania Chapter of the American Academy of Paediatrics 2014; Department of Health 2018). No Medicare funding is available for services provided to meet patient/client needs that are outside of the strict Medicare item benefits schedule of services. This oversight is costly for the children, the family and Medicare.

Nurse practitioners have specialist knowledge and skills, and the authority to use extended practice privileges to make informed and autonomous decisions on preventative, diagnostic and therapeutic management. Care of vulnerable populations and those living in disadvantage support the use of Nurse Practitioners as it is a cost-effective model of /care (Woo, Lee & Tam 2017; Jennings et al. 2015). Adding an Aboriginal NP clinician to this health care model would further improve benefits for Aboriginal family users.

The Nurse Practitioner conducted a comprehensive health assessment in accordance with the Medicare Scheduled activity with each child referred to the service. The health assessment included an assessment of the child's health, including their physical, psychological and social wellbeing. The NP also assesses all preventive health care, education and other assistance required to improve the child's health and wellbeing.

This health assessment included:

- information collection, including taking a patient history and undertaking examinations and investigations as required.
- making an overall health assessment of the child.
- recommending appropriate interventions, providing referrals with support to attend referral services and follow up.
- providing advice and information to the patient and parents as appropriate.
- keeping a record of the health assessment, and offering the patient/parents a written report about the health assessment, with recommendations about matters covered.

As part of a health assessment, the NP assisted in developing simple strategies for the good health of the child. The health assessment categories and data required is available in a de-identified non-traceable manner to ensure client confidentiality.

The program has resulted in:

- Increased access to care that directly addressed the complex health and social needs for children.
- Holistic, advanced, and comprehensive assessments provided by the Nurse Practitioner.
- Extended collaborative care services e.g. longer support and consultation/ treatment times.
- Supported interdisciplinary referrals addressing the multimodal interventions required by children

The overall intake of clients in the Inner Southern Homelessness service for this period was 612, with 22% of the children using the NP service identifying as Aboriginal and Torres Strait Islander, and of the clients using ISHS, 29% aged 0 to 16 years old. All children referred to the Nurse Practitioner (NP) service received a comprehensive and in-depth health assessment.

Evaluation of the Nurse Practitioner-led service

A pilot evaluation of the service was conducted between Dec 2019 to Oct 2020 with families/child referrals during this period. The research team from Flinders University conducted the evaluation in partnership with the Nurse Practitioner and ISHS. Additional funding was required to reimburse the Nurse Practitioner has evaluation activities are not covered under Medicare.

The aims of the pilot were to:

1. identify health needs, refer to appropriate health, educational and welfare services, support compliance, follow up referrals and treatment plans, and encourage regular health checks.
2. test the Nurse Practitioner 'Health Navigator' model of care efficacy through evaluation of parent compliance with referrals to medical, psychological, and educational interventions for their children.
3. determine the effectiveness of the NP-led service and opportunities to upscale (NGO Homelessness Services state-wide).

The research process for the pilot study was:

Stage 1: Nurse Practitioner comprehensive health assessment:

1.1 Using the comprehensive health assessment tool, (based on the WHO child assessment tool (WHO 2008), and the extensive NP paediatric training (Parry et al 2016; Parry and Willis 2013;, Parry 2012), the NP measured the levels of health need in children accessing homelessness services expanding our current knowledge.

1.2 De-identified nominal measures and condition severity scores were added to the data collection tool).

Quantitative data collection: age of child, the presenting condition, severity of condition, immunization status, Treatment by NP, Aboriginal Torres Strait Islander or Refugee identity, referral provided, usual health access, difficulties in appointment attendance, and the need for NP home visit e.g. parental

agoraphobia or anxiety is collected (Neuman et al 2014; USAID 2013) as it demonstrates a barrier to child health assess (Aim 1 and 2).

Stage 2: Monitoring of Referral Compliance and pathway:

Stage 2 has commenced and the future research (Jan 2021) will consolidate and improve the current tools

2.1 Using the developed NP referral pathway and tracking measures (the USAID Referral Systems Assessment and Monitoring Toolkit) (Neuman et al 2014; USAID 2013), following the referral, the children and families were linked to GP primary health, allied health, and acute care services. A feedback loop from referral partners measuring compliance e.g. hospital admission, GP use, optometry, audiology etc data was collected.

2.2 Establishment of the Research Reference Group (RRG) at ISHS (Aim 1, 2 and 3).

Findings

Our findings have established a dire need for health access for children aged 0-18 years living in housing instability.

Table 1 demographic data

Ages	7 weeks to 16 years all children were living with their families in homelessness
NP responses: 62% of all children required treatment by the NP	Severe condition requiring immediate action/intervention = 26% (ASAP referral and treatment)
	Moderate condition = 18% (needs referral but can wait on the public list)
	Minor = 22% (does not need immediate referral)
Immunisation status	No immunisation, incomplete immunisation or no proof 82%
	Fully immunised 6%
	Did not answer the question 12%
Home visit requirements	A home visits were required 86%
	No home visits was required 14%

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The figures presented below represent the initial descriptive analysis of factors present in this population that impact on their ability to access adequate health access. Some of the barriers are system created and others are due to the family circumstances. Regardless of the cause there is a necessity to ensure children receive appropriate care in a timely fashion to prevent the progress of ongoing and lifelong health deficits and preventable conditions.

Figure 1 below illustrates the overall levels of the presenting health needs for the children attending the embedded NP led clinic at the homelessness service. Of the children presenting 62% have a health condition in need of intervention and treatment.

Figure 1: The overall health of the children attending the NP led clinic

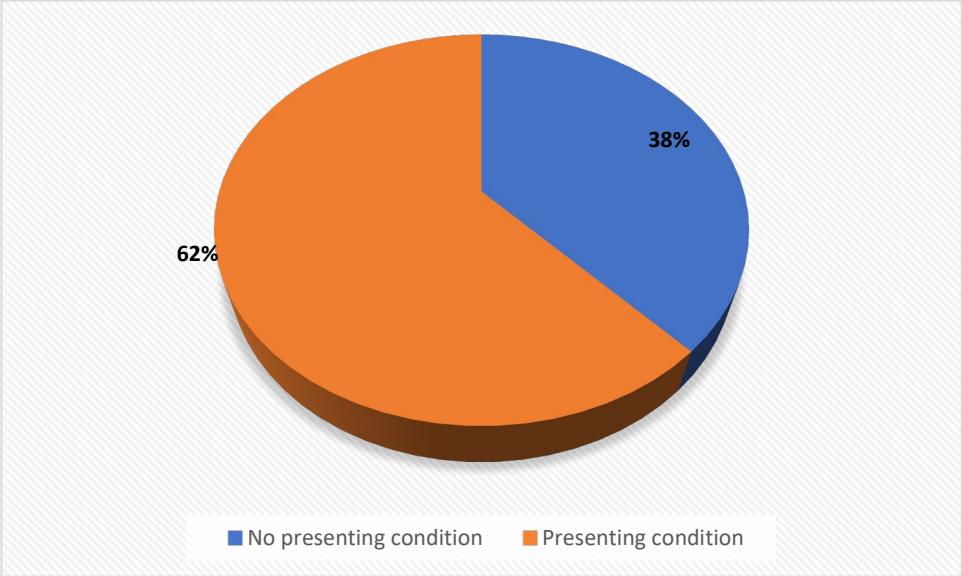


Figure 1 above illustrates the levels of childhood illness impacting on the lives of the children using the ISHS. These levels of ill-health are above the Australian average which is currently 14% who rate their health as poor (AIHW 2018).

Figure 2: Severity of the presenting health conditions

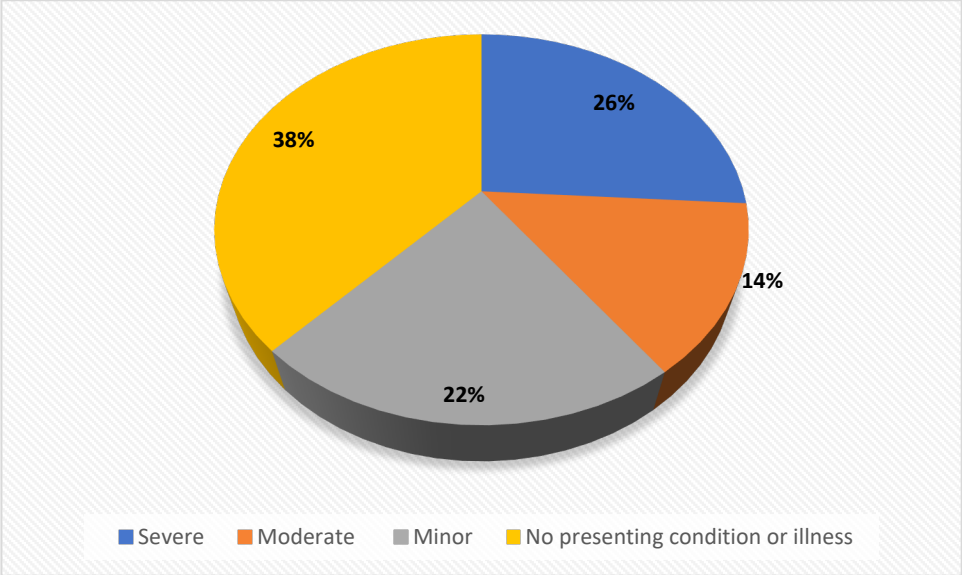


Figure 2 above found 26% of the children presented with a severe condition, requiring immediate treatment and referrals, while 14% presented with a moderate level condition requiring treatment and referral, and 22% of the children had a minor condition that could be treated and may not have required a referral or the referral wait time matched the public hospital treatment wait time.

Figure 3 below highlights the confirmed rates of immunisation among the children accessing the embedded NP led clinic. Of the children attending only 6% were fully immunised to the approved level

given their age. Many children had missed immunisations or had not received immunisations and the NP devised ‘catch up’ immunisation plans and support for appointment compliance.

Figure 3: Immunisation status of children attending the NP led clinic

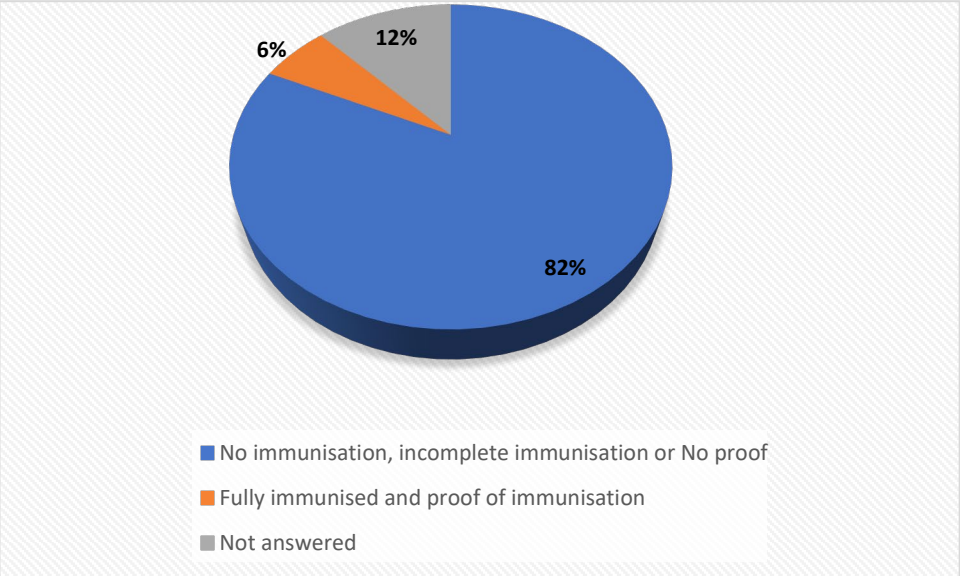


Figure 4 below highlights the use of the home visiting aspects of the NP led clinic to meet the children’s health access needs. Of the families attending the NP led clinic. Overall, 86% required a home visit and 14% attended at the ISHS service. The Figure 4 results were further analysed to determine the factors involved in the high levels of home visiting and found: 29% were impacted by COVID19, 27% of the families had no access to transport, 24% had a variety of reason and 20% were unlikely to attend.

Figure 4: Percentage of home visits provided by the NP

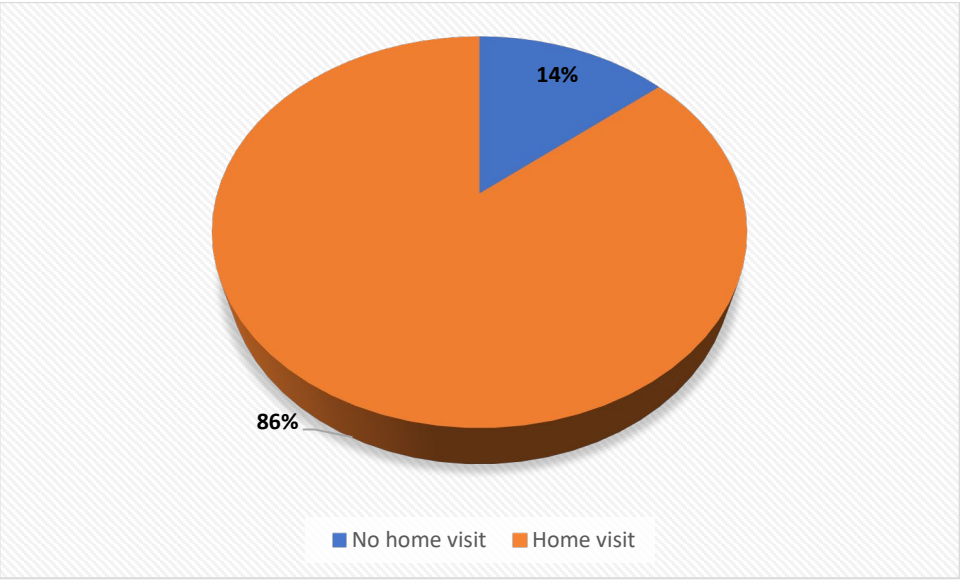
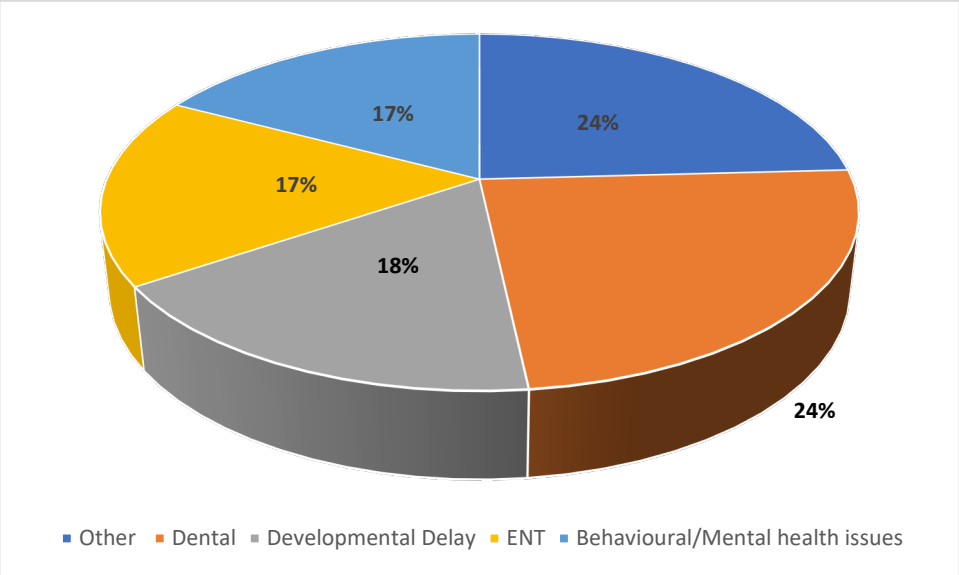


Figure 5 below illustrates the presenting condition of the children attending the NP led clinic. The in-depth health assessments provided by the NP were often the first comprehensive health assessment the children had received since birth. The results presented in Figure 5 above show that 18% of the

children had a developmental delay, 17% had behavioural and/or mental health issues, 17% required an ENT intervention, 24% had dental issues and 24% have a variety of presenting conditions.

Figure 5: Results of the comprehensive health assessment



Future research grant: Channel 7, 2021:

A Channel 7 research grant has been received which will extend the research project to comprehensively measure the impact of the services on children's health and to follow up the referral pathways. Stage 3 and 4 outline the evaluation steps.

Stage 3: Qualitative evaluation:

3.1 To determine the effectiveness of the NP intervention 30 semi-structured qualitative interviews and 10 case study reviews will be conducted. Drawing on the expertise of the Research Reference Group (RRG), 20 families receiving the NP intervention (pool of 250), and further 10 staff/managers from the homeless-service will be invited to be interviewed and 10 case studies will be randomly selected for audit of health outcomes of the NP intervention.

3.2 Barriers and facilitators to health access including the use of the NP 'Health-Navigator' service will be identified.

The qualitative data will be thematically analysed for dominant themes.

Stage 4: Quantitative Family evaluation:

One hundred (100) families will be invited to complete the post NP intervention evaluation questionnaire using the validated International Nurse Practitioner Satisfaction Survey [47] (first time used in Australia). Findings from these two consumer data sources (20 parent and staff interviews and 10 case studies) will be triangulated with the post NP-led survey results. Data will add to the structured equation modelling analysis [57].

The intervention/evaluation reflects the complexity and depth of the unmet need in these children. This single arm before (the NP maps current health access levels) and after study will track the children and families and measure the change in referral uptake and health outcomes over the length of time they engage with the homeless-service.

Conclusion

This research has project has documented the impact of detrimental under-servicing of healthcare needs of disadvantaged children living in housing instability or homelessness in South Australia. If these

levels of childhood illness, disability, developmental delay, and lack of immunisation were present in the broader child population the motivations to address them would be immediate and comprehensive. The invisible nature of children in housing instability means their needs are not addressed, and they are under-served and ignored. The true levels of childhood health for children living with housing instability require immediate research and health service support. The Nurse Practitioner-Led model of health service delivery, with comprehensive and in-depth health assessments and extensive referral support, is one effective response. However, a whole of health response is also required. Including an increase and expansion in the remuneration of NPs within the Medicare benefits scheme and the expansion of this service innovation into other homelessness and community health services.

Financial Support for the pilot

Better Lives, Better Care, Better Communities, 2019 External Funding Accelerator Scheme provided the funding for the initial pilot project.
Funding of $3,989 AUD was received from the Flinders University, Caring Futures Institute,
A further $10,000 was received from Uniting Care Wesley Bowden to extend the services provision and data collection of the pilot study.
The funding bodies have had no influence on the design, execution, analysis and/or write-up of the study.

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Acknowledgements
The authors are thankful for the Uniting Care Wesley Bowden (UCWB) organisation's commitment to partnering with Flinders University to deliver this innovative Nurse Practitioner service and research within their already existing homeless service agency.

Conflict(s) of Interest
None.

Ethical Standards
The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation, Social and Behavioral Research Ethics Committee (SBREC) Project No. 8502, and with the Helsinki Declaration of 1975, as revised in 2008.
Results obtained from sources where not deemed essential to receive informed consent: All de-identified secondary analysis data. Inner Southern Homelessness Service is required to collect data on attendance levels and referrals by staff to other organisations such as health, education, and welfare rates. This includes demographic data such as age, educational attendance, health service use or needs. The data collection already occurs, and this is a de-identified secondary analysis of existing data.

Acknowledgements
We would sincerely like to thank Uniting Care Wesley Bowden (UCWB), CEO Ms Fiona Kelly, Inner Southern Homelessness Service, Manager, Sheryl Maung, the staff, and clients for their ongoing support, collaboration and partnership in this research.

We would also like to thank the Minister for Health, Mr Stephen Wade for his support in opening the clinic.

The research team would extend its thanks to the Caring Futures Institute, Flinders University for the accelerator grant which along with the funds from UCWB enable the pilot phase of the research to be implemented. Thanks, are also extended to the many families who have been part of this study.

Authors
Dr Yvonne Parry (CIA), Caring Futures Institute, Flinders University, South Australia.

Prof Eileen Willis (CIB), College of Nursing and Health Sciences, Flinders University,

Prof Sally Kendall CIC), Centre for health Services Studies, University of Kent, UK

Prof Rhonda Marriott (CID), a Nyikina woman, and Pro Vice Chancellor Aboriginal and Torres Strait Islander Leadership, and Director of Ngangk Yira (Sun Rising) Research Centre, Murdoch University.

Dr Nina Sivertsen (CIE) College of Nursing and Health Sciences, Flinders University, and

Mrs Alicia Bell, Paediatric ED NP, College of Nursing and Health Sciences, Flinders University.

Suggested citation: Parry, YK., Willis, E., Kendall, S., Marriott, R., Sivertsen, N., and Bell, A., (2020) Addressing the gaps in health for children, Innovative Health Service delivery: Enhancing lifelong development and the health and wellbeing of marginalised children 0 to 18 years. Caring Futures Institute, Flinders University. **ISBN: 978-1-925562-40-8**

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Publications

The following publications are linked to this research:

Yvonne Parry, Eileen Willis, Sally Kendall, Rhonda Marriott, Nina Sivertsen and Alicia Bell (2020) Meeting the needs of marginalised children: An innovative Nurse Practitioner led health care model at Uniting Care Wesley Bowden. Australian Nursing and Midwifery Journal, VOLUME 26, No. 10, APR–JUN 2020 pg. 48-49.

Sivertsen, N. Parry, YK., Willis, E., Kendall, S., Marriott, R., Bell, A., (2020), Aboriginal children and family connections to primary health care whilst homeless and in high housing mobility: A Nurse Practitioner led response. Primary Health Care Research & Development (under review)

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