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## Health workforce turnover, stability and employment survival in remote NT health centres 2004-2015

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### Abstract

**Background:** Delivering effective primary care to where it's needed most – specifically remote Aboriginal communities – is hampered by high turnover and low stability of health centre staff and a lack of evidence about this to inform remote workforce policy making. This research describes the turnover, stability and employment survival patterns over 12 years in remote Northern Territory (NT) health centres.

**Methods:** Descriptive statistics and marginal structural analysis of Department of Health payroll data, 2004-2015, for all staff based at 54 government-run remote NT health centres. Main outcome measures were annual turnover rates, 12-month stability rates and employment survival probabilities. Outcomes were investigated by health centre, calendar year, professional discipline, geographical remoteness and the periods before and after the NT Emergency Response in 2007.

**Results:** Annual turnover rates for all staff combined averaged 118% (95% confidence interval (CI) 113-124%), declining significantly over time (175% in 2004 to 92% in 2015;  $p < 0.05$ ). Turnover rates were significantly lower after the NT Emergency Response (66% lower, 95%CI 48-85%).

Stability rates increased for all staff combined (41% in 2004 to 51% in 2015;  $\chi^2 = 12.5$ ,  $p < 0.001$ ), averaging 49% overall (95%CI 42-56%). The most stable health centre had a mean 12-month stability rate for all staff that was 6 times higher than the least stable health centre (11% versus 66%,  $\chi^2 = 35.6$ ,  $p < 0.01$ ).

Aboriginal Health Practitioners had significantly lower annual turnover rates (53%; 95%CI 46-61%) and higher probability of remaining employed 12 months after commencing employment (0.53; 95%CI 0.46-0.59) compared to other professional groups.

Nurses employed directly by the Department of Health had significantly higher annual turnover rates (150%; 95%CI 141-160%) than other professional groups, with no improvement over time. If unit-level agency-employed nurse data were included in turnover calculations, nurse turnover almost certainly would have increased over the study period.

After adjusting for confounders such as geographical remoteness, employment arrangements, profession and time period, Aboriginal employees had a 16% lower risk of leaving a community compared to non-Aboriginal employees (95%CI 3-27%).

**Discussion:** This study enumerates longstanding and unacceptable levels of staff turnover and stability in remote NT, especially amongst nurses. Continuing investment is needed in comprehensive, multi-faceted short and long-term retention strategies. Substantial variation between health centres suggests that retention strategies should be carefully tailored to local community and staff needs. Stronger employment pathways are needed for local Aboriginal people. Job satisfaction and retention can also be improved by ensuring that all employees feel valued and supported, that community knowledge and cultural skills are recognised and respected along with clinical skills, and staff workloads are sustainable.

## Introduction

Aboriginal people living in the Northern Territory (NT) experience the lowest life expectancy of any Aboriginal and Torres Strait Islander population living in Australia, with a persistent mortality gap when compared to non-Indigenous Territorians and to non-Indigenous Australians.(1) A large body of evidence now exists showing that reductions in mortality, improvements in other health outcomes and better overall patient experience are associated with higher levels of continuity of primary care especially for disadvantaged and vulnerable populations.(2)

Providing continuity of primary care to remote populations in the NT, however, is very challenging. Aboriginal Controlled Community Health Services (ACCHSs) and the NT Department of Health (DOH) are the key organisations responsible for delivering primary care to remote communities. For both ACCHSs and the NT DOH, a key limiting factor in meeting their primary care service delivery responsibilities has been ongoing high levels of staff turnover and heavy reliance on short-term staff including agency nurses.(3-6) In order to be able to adequately address these issues, NT policymakers are in great need of high quality evidence, both quantitative and qualitative, enumerating turnover and stability patterns amongst remote staff and identifying how the remote primary care workforce might best be stabilised. Much of the available evidence to date has been piecemeal in nature, investigating a single profession, for example, and either anecdotal or only published in the grey literature without the benefits of peer review.(4, 5, 7) The lack of rigorous evidence and peer-reviewed publications partly relates to a lack of comprehensive data – workforce data, for NT DOH personnel, for example, does not include the individual level data for nurses paid directly by nursing agencies needed to measure turnover, stability and survival probabilities. Individual level data on staff employed by ACCHSs are also not available in a single accessible dataset.

Nevertheless, given the critical need to understand the state of workforce supply and retention, and acknowledging the limitations of available datasets, this paper aims to describe the turnover, stability and employment survival of staff employed directly by the NT DOH in remote NT government-funded health centres, taking important potential confounders into account. These include employee professional, geographical remoteness and the NT Emergency Response (NTER) which commenced in 2007 and was associated with substantial increases in funding for remote primary care, including for the recruitment and retention of staff in remote NT.

## Methods

This retrospective cohort study comprises analyses of NT DOH Personnel Information and Payroll System (PIPS) data for all staff directly employed by NT DOH in any of the 54 NT remote government-run health centres during the period 2004-2015.

The main outcome measures were annual turnover rates, 12-month stability rates and employment survival probabilities, (8) defined as shown in Table 1.

Variation in annual turnover and 12-month stability rates were assessed by:

- calendar year;
- staff employment category: nursing, Aboriginal Health Practitioner (AHP), administrative officers and physical (drivers, cleaners and gardeners); and
- de-identified health centre.

**Table 1 Study outcome measures**

Measure / Definition
Annual turnover rate (%) $= \frac{\text{total number of exits}^\dagger \text{ in 12-month period}}{\text{average number of employees in 12-month period}} \times 100$
12-month stability rate (%) $= \frac{\text{Number of employees at start of 12-month period who remain employed 12 months later}}{\text{Number of employees at start of 12-month period}} \times 100$
Employment survival probabilities $= \frac{\text{Number of employees remaining employed in a specific remote community beyond a specified time}^\ddagger}{\text{Number of employees at risk of exiting the specific remote community at the specified time}}$

†an exit was defined when an employee left one of the health centres for a period of more than 12 weeks

‡time was defined as the time from commencement in a specific health centre

Variation in employment survival probabilities were additionally assessed by:

- time period: pre-2007 or 2007 and later (corresponding to the NTER);
- NT region: Top End or Central Australia;
- employment fraction: part-time (<80 hours/fortnight) or full-time employment (80+ hours/fortnight);
- Aboriginal and non-Aboriginal;
- geographical remoteness: straight line distance to the major regional centres of Darwin or Alice Springs, (using Google maps) grouped into three categories (<200km; 200-299 km; and ≥300 km); and
- employment arrangements: categorised as permanent, fixed term and casual.

Chi square ( $\chi^2$ ) tests for trends in 12-month stability rates, calculated each calendar year, were undertaken. Marginal structural analysis modelled the hazard of leaving employment in a remote NT community, adjusting for variations over time in employment arrangements and employment fractions as well as for other variables such as health centre location and the time period.<sup>(9)</sup> A significance level of  $\alpha=0.05$  was used throughout. All calculations were performed in StataSE 15 (StataCorp) and Microsoft Excel 2016.

The Human Research Ethics Committee of the NT DOH and the Menzies School of Health Research (2015-2363) provided ethics approval.

## Results

Annual turnover rates decreased from 175% in 2004 to 92% in 2015 ( $p<0.05$ ) while during the same period 12-month stability rates increased from 41% to 51% ( $\chi^2=12.5$ ,  $p<0.001$ ) (Figures 1A and 1B). There was no significant change in employment survival probabilities between 2004 and 2015 (Figure 1C).

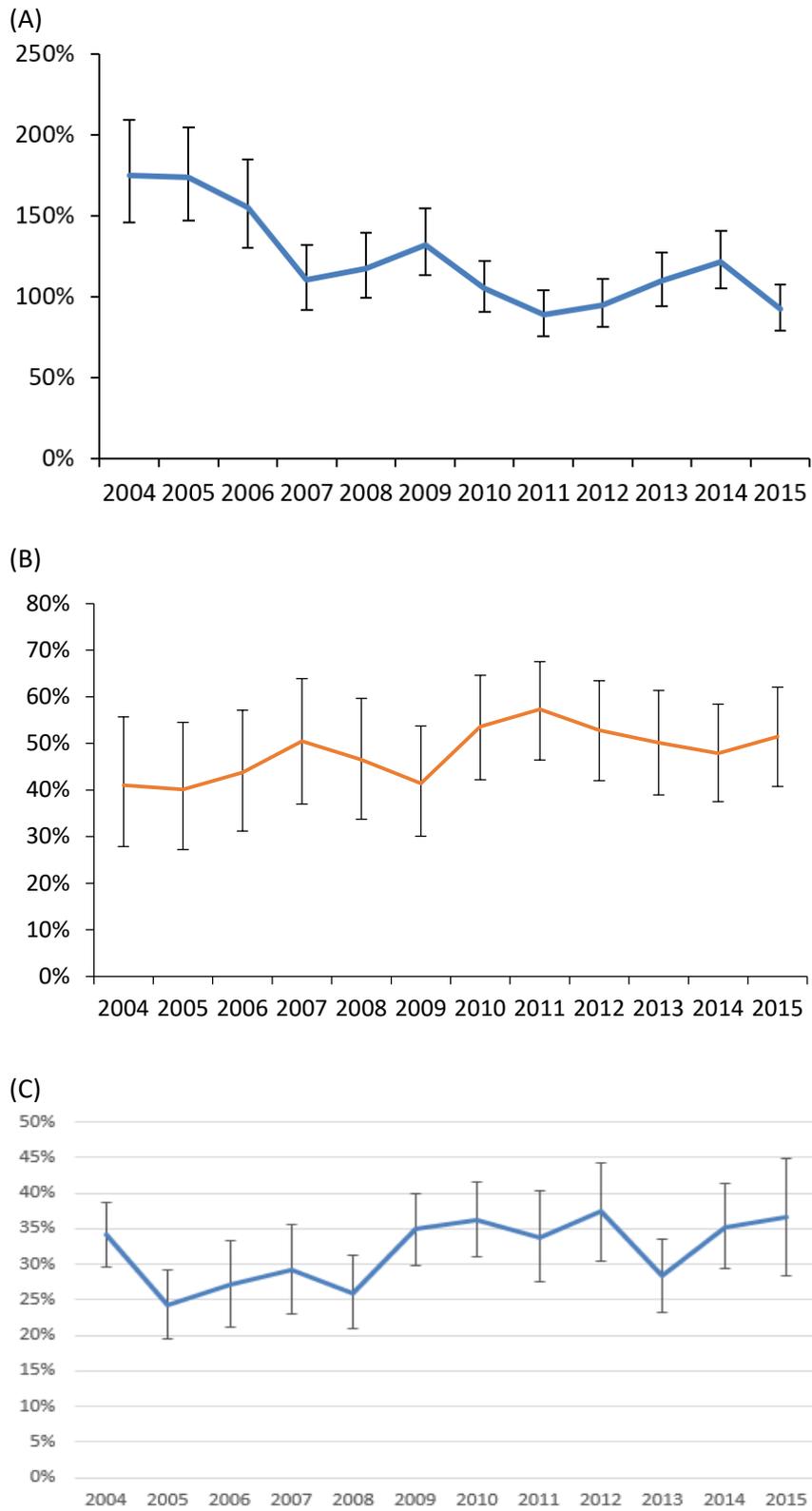
The annual turnover rate for all remote health centre staff in the study period (calculated as the total number of all staff exits divided by the average size of the total remote workforce) was 118% (95% confidence interval (CI) 113-124%). (Figure 2A) Nurses had significantly higher annual turnover rates (150%; 95%CI 141-160%) than other professional groups while AHPs had significantly lower annual turnover rates (53%; 95% CI 46-61%) than any other professional group. Turnover rates were also significantly lower after the NT Emergency Response commenced in 2007 (66% lower, 95%CI 48-85%).

The average 12-month stability rate at remote health centres was 49% (95%CI 45-52%). (Figure 2B) The 12-month stability rates for nurses (45%; 95%CI 39-50%) was lower than for AHPs (71%; 95%CI 62-78%).

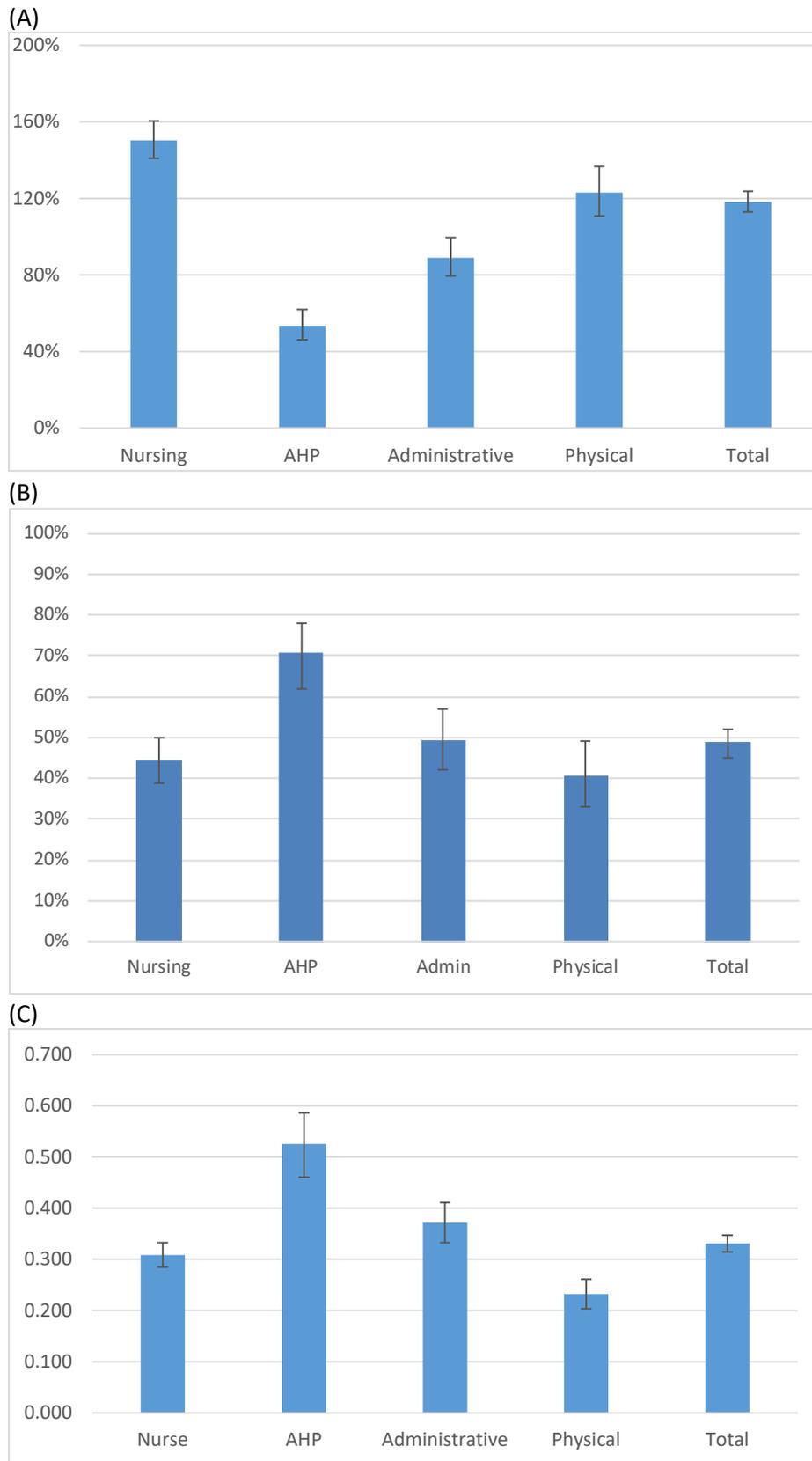
The probability of remaining employed in a remote community 12 months after commencing employment was significantly higher for AHPs (0.53; 95%CI 0.46-0.59) compared to any other professional group and lowest for staff employed in a physical employment category (0.23; 95%CI 0.20-0.26) (Figure 2C).

There was substantial variation between individual remote health centres in their mean turnover rates, 12-month stability rates and employment survival probabilities in the study period. An approximately 6-fold difference was noted between health centres with the lowest and highest workforce turnover and stability rates (turnover minimum 44% and maximum 256%, stability minimum 11% and maximum 66%). (Figures 3A, 3B and 3C) The simple mean annual staff turnover rate for the 54 remote health centres was 130% (standard deviation 45%). The median 12-month stability rate for the remote health centres was 40% (Interquartile range 36-47%) while the median 12-month employment survival probability was 30% (Interquartile range 24-37%).

**Figure 1** Annual turnover rates, 12-month stability rates and employment survival probabilities for all staff employed directly by NT Department of Health in remote health centres with 95% confidence intervals, 2004-2015



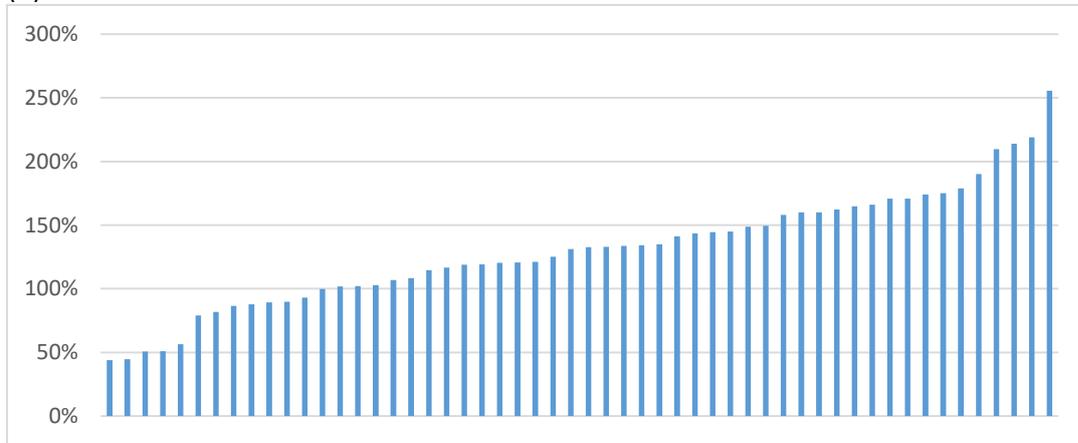
**Figure 2 Annual turnover rates, 12-month stability rates and employment survival probabilities after 12 months, by staff employment category with 95% confidence intervals, remote health centres, NT Department of Health, 2004-2015**



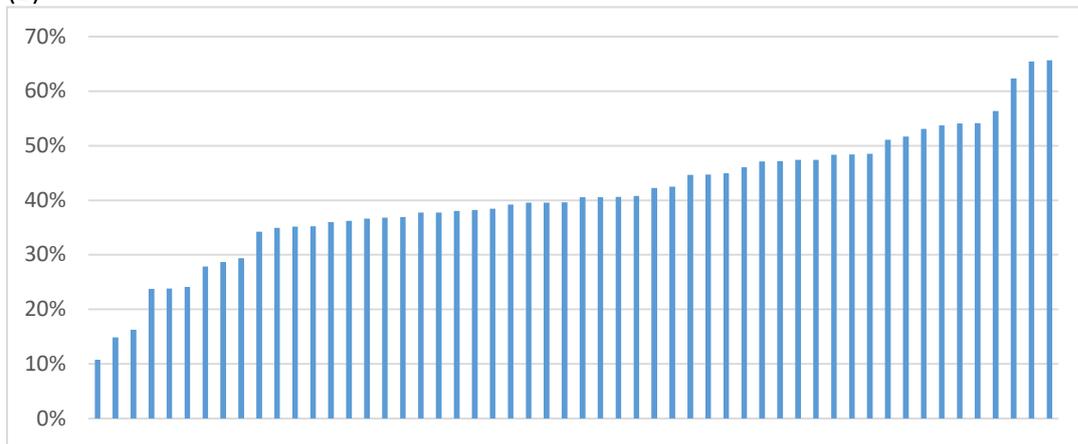
AHP: Aboriginal Health Practitioner; Total: all remote staff

**Figure 3 Annual turnover rates, 12-month stability rates and employment survival probabilities after first 12 months of employment, by remote health centres, DOH, 2004-2015**

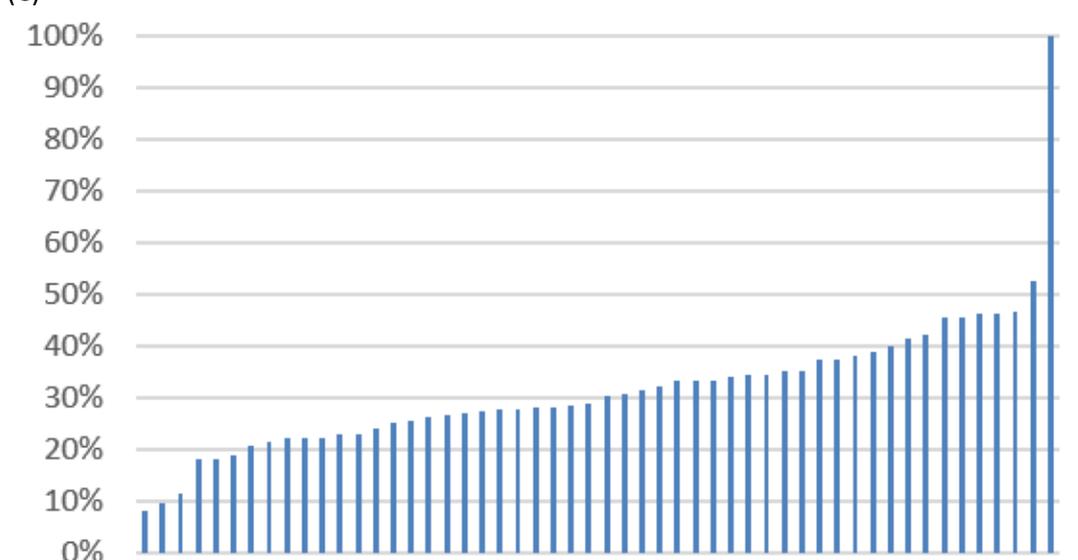
(A)



(B)



(C)



Marginal structural analysis revealed a significantly increased hazard of leaving employment in a remote community associated with increasing geographical remoteness of the community (22-24% higher compared to communities less than 200km from Darwin or Alice Springs), working part-time (70% higher compared to employees who worked full-time) and time period (10% lower following NT Emergency Response commencement in 2007). (Table 2) Importantly, once these factors were adjusted for, a lower hazard of leaving remote communities was found amongst employees in the physical employment category (25% lower compared to nurses) and Aboriginal employees (16% lower compared to non-Aboriginal employees). Employees with tenure also had a lower hazard of leaving a remote community (50% lower compared to casuals), as might be expected.

**Table 2 Marginal structural analysis model of factors associated with employment survival for all staff employed directly by NT Department of Health in remote health centres, 2004-2015**

	HR	p	95% CI-LL	UL
Period 2007-2015 (ref=pre-2007)	0.898	0.013	0.825	0.977
AHP (ref=nurse)	0.920	0.442	0.742	1.139
Administrative (ref=nurse)	1.009	0.728	0.905	1.169
Physical (ref=nurse)	0.745	0.000	0.661	0.838
Part-time (ref=full-time)	1.706	0.000	1.483	1.962
Aboriginal (ref=not Aboriginal)	0.842	0.018	0.730	0.971
Central Australia region (ref=Top End)	1.080	0.079	0.991	1.178
Fixed term contract (ref=casual)	0.561	0.000	0.480	0.656
Ongoing contract (ref=casual)	0.492	0.000	0.414	0.585
200-300 km (ref=<200 km to Darwin/Alice Springs)	1.216	0.000	1.093	1.352
>300 km (ref=<200 km to Darwin/Alice Springs)	1.242	0.000	1.116	1.381

ref: reference category

## Discussion

While it is somewhat encouraging that turnover, stability and employment survival probabilities for all NT DOH staff employed directly by the DOH in remote communities have improved since 2004, at the same time the current absolute levels of turnover and stability remain discouraging. Annual turnover rates for all staff of around 100% and 12-month stability rates of around 50% are likely to compromise retention of key local community and organisational knowledge and effectiveness of primary health care services. High levels of turnover of clinical staff may result in patients – who frequently have complex and chronic problems – being seen by a different clinician each time they present for care, rarely having the opportunity to build up a strong and trusting therapeutic relationship over time, and continually having to tell their story to someone new.

Further, annual turnover rates for nurses directly employed by NT DOH were much higher again, averaging 150% per annum between 2004 and 2015. Our previous estimates of nurse turnover rates (using the same methodology) for the three-year period 2013-2015 were almost exactly the same at 148%, demonstrating a lack of substantial change over time in turnover rates for department employed nurses.(10)

What is perhaps even more concerning is that these very high turnover and low stability rates, especially for nurses, are an underestimate of actual turnover and an overestimate of actual stability rates. They do not capture the use of nurses employed directly by employment agencies – which previous research shows has increased between 2005 and 2011 and since then comprises approximately 15-20% of the total nurse workforce.<sup>(6)</sup> While a lack of available individual-level data on agency-employed nurses limits our ability to comment on overall trends in turnover and stability of nurses working in remote NT DOH health centres during the study period, we can assume that overall a substantial increase in nurse turnover has occurred in remote NT that is approximately equivalent to the turnover associated with employing 15-20% of nurses directly through agencies. Notwithstanding the limitation of being unable to directly calculate turnover rates for agency-employed nurses, the study provides strong empirical evidence of the ongoing need for effective retention strategies in remote NT for all staff types.

Our research also found that Aboriginal employees had a 16% lower risk of leaving a remote community compared to non-Aboriginal employees. The mechanism by which Aboriginal people have a reduced likelihood of turnover from a remote health centre is likely to relate to their strong attachment to the community and country compared to non-Aboriginal people. The finding is consistent with Australian research indicating that Aboriginal health professionals are more likely to practice in remote settings.<sup>(11)</sup> While there is some overall evidence of increased employment of Aboriginal staff in roles such as drivers, cleaners and gardeners which commenced prior to the NTER and increased employment of Aboriginal Health Practitioners from the commencement of the NTER in about 2007, Zhao et al. also noted declines in employment of Aboriginal Health Practitioners from 2010.<sup>(6)</sup>

This research suggests that remote health workforce stability could be enhanced in the medium and longer term by policies that provide better support for the education, training and employment of local Aboriginal community members in remote health centres in clinical and non-clinical roles and integrated remote area nursing pathways for Aboriginal and non-Aboriginal Territorians. Such policies would be consistent with international and Australian literature which supports the effectiveness of 'grow your own' workforce initiatives for rural and underserved locations.<sup>(12, 13)</sup> Additionally, retention of existing Aboriginal employees could be improved by ensuring that health services provide a work environment in which all employees feel valued and supported and in which community knowledge and cultural skills are recognised and respected along with clinical skills. Additionally, the attractiveness of employment in the health sector could be improved for remote community members by providing housing support and by ensuring that each health centre is properly staffed and workloads, including on-call, are manageable. Even small, incremental improvements in working conditions can help boost staff morale, improve job satisfaction and reduce turnover. However, it is important that retention initiatives are not isolated and piecemeal, but instead are part of a well-planned, comprehensive, yet flexible package tailored to balance the needs of communities with those of key health staff. A comprehensive strategy should include efforts to minimise risks of staff burnout. Generous leave arrangements, for example, may be useful for some staff members, while for other staff members employment arrangements where they can be rotated in and out of the same community, say every 6 weeks, might be more sustainable and support retention.

A large degree of variability in staff turnover and retention between remote health centres was evident – from centres with comparatively high workforce stability to those that were highly unstable. By identifying remote health centres that were turnover and stability outperformers (and underperformers) this study created opportunities to learn from what works (and doesn't work) with regard to retention strategies. This part of the research, comprising an in-depth qualitative

study of health workforce patterns in a small number of remote health centres is continuing and will be reported elsewhere. Nevertheless, this level of variability over the 12-year study period supports the need for flexibility in developing retention strategies, and for understanding both system-wide and local staffing issues so that retention packages can be developed which are both comprehensive and well-targeted. Ensuring workforce supply is sufficient to meet community needs while not unduly overburdening staff workloads is also likely key to workforce retention in remote communities, which have been historically under-resourced.

A key limitation of this study was that only some agency nurses are captured on the payroll; other agency nurses are paid directly by the agencies and so their personnel data were not captured in this study. Trends in the use of this latter group of nurses paid directly by agencies, however, has been reported elsewhere.<sup>(10)</sup> A further limitation of the study was that it was not possible to allocate staff working in a supernumerary capacity in a remote health centre to a specific health centre as the health centre in which they were working was not recorded in the payroll records. Additionally, it was not possible to differentiate whether turnover of staff at remote health centres was planned and optimal, or unplanned, unexpected and suboptimal from the NT DOH perspective. As an example of the former, temporary staff from a central relief pool back-fill positions to enable remote staff to take planned annual leave or planned continuous professional development would be captured as an exit. An example of the latter might be a health centre forced to rely excessively on last-minute engagement of comparatively expensive agency-employed staff to fill an unexpected vacancy when a disgruntled staff member leaves. Also, the NT DOH policy to backfill nursing positions and not other positions may partially explain why nursing turnover rates are much higher than for other employment categories. Finally, health centre outreach visits provided by regional staff such as allied health, specialist nursing, AHP and medical staff providing primary care were not included in the analysis, as there were no reliable individual-level data available.

## Conclusion

This study enumerates longstanding and unacceptably high levels of staff turnover and unacceptably low stability and employment longevity in remote NT health centres. These findings, despite their limitations, show that continuing investment is needed in comprehensive, multi-faceted retention strategies. The substantial variation evident between health centres suggests that flexible strategies are needed so that retention strategies can be appropriately tailored to the needs of communities and staff working in those communities. Further, significant variations in stability according to Aboriginal status highlight the importance for workforce retention of ensuring that stronger employment pathways are created for local Aboriginal people to train for clinical and non-clinical roles. Job satisfaction and retention can also be improved by ensuring that all employees feel valued and supported, that community knowledge and cultural skills are recognised and respected along with clinical skills, and staff workloads are sustainable.

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## Presenter

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