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Regional variation in cervical cancer screening participation and outcomes among Indigenous and non-Indigenous Australians: Queensland (2006-2011)

Final Report
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Executive summary

Background

Since the implementation of the Australian National Cervical Screening Program (NCSP) in 1991, cervical cancer incidence and mortality rates in Australia have halved. However, Aboriginal and Torres Strait Islander women, respectfully referred to as Indigenous women, continue to experience a higher burden of cervical cancer. Since its inception, the NCSP has been unable to report on standard program indicators for Indigenous women as Indigenous status is not routinely collected by Pap Smear Registers (PSRs).

The NHMRC-funded 'National Indigenous Cervical Screening Project' (NICSP) is using probabilistic record linkage methods to combine population-based administrative databases to identify women in the PSR who are Indigenous. Analyses of the Queensland-specific cohort found that Indigenous women had consistently lower participation rates, higher prevalence of high-grade cervical abnormalities and lower rates of clinical investigation within the recommended two-month period.

Aims

This report describes geographical patterns in screening participation rates, prevalence of high-grade cervical abnormalities and rates of clinical investigation within two-months of an abnormal Pap test for Indigenous and non-Indigenous women across 78 Local Government Areas (LGAs) in Queensland. Additional estimates by larger Primary Health Networks (PHN) and Hospital Health Service (HHS) are also presented.

Methods

All analyses were carried out using the Queensland-specific cohort for the NICSP project and included all women in Queensland, aged 20-69 years, who underwent a Pap smear between January 1 2006 and December 31 2011.

Statistics by small geographical areas can fluctuate widely, particularly for sparsely populated areas or relatively rare outcomes. The concept of spatial smoothing involves borrowing information from surrounding areas to calculate the LGA-specific estimates, thus producing more reliable and robust estimates that reflect the underlying geographical patterns. As the population of a given LGA becomes smaller, the effect of smoothing becomes more prominent. Even with smoothing, the small counts in many LGAs meant we needed to focus on five-year screening intervals for the LGA-analyses.

Smoothed estimates are presented as maps that capture the magnitude of the spatial estimates across LGAs with accompanying graphs indicating the level of precision of the mapped estimates. Separate maps and graphs are provided for Indigenous and non-Indigenous women for each measured outcome.

Key findings

There were high levels of geographical variation in cervical screening participation rates and prevalence of high-grade abnormalities across LGAs in Queensland from 2006 to 2011, with some suggestion of geographical variation in the timely follow-up of abnormal Pap smear results. These patterns were also seen across larger geographical areas. This variation was more pronounced among Indigenous women, which meant that the magnitude of the Indigenous and non-Indigenous differential also varied substantially across Queensland. However, a consistent pattern of poorer participation and related outcomes for Indigenous women was evident across all geographical areas in Queensland.

There was some evidence that Indigenous women in South East Queensland had consistently lower participation rates than the state average, whereas corresponding rates were higher than average in Far North Queensland.

Overall, these results suggest there are opportunities to improve screening participation and outcomes among Indigenous women in many geographical areas. This report is the first to present small-area maps of cervical screening participation rates and related outcome measures in Queensland by Indigenous status. It provides a valuable resource for those administering cervical screening programs to identify areas of disparity and motivate investigations to uncover why these patterns exist.

From December 2017, the renewed cervical screening program will involve five-yearly primary Human Papillomavirus (HPV) instead of cytology testing. It is likely that the key factors influencing participation in the Renewal mainstream program, which still requires the collection of a cervical sample by a clinician for HPV-testing, will be similar to those that impact participation in Pap test based cervical screening. One opportunity arising from the Renewal to improve screening coverage is self-sampling for women who decline to have a clinician collect the sample. While this offers a great opportunity to extend screening coverage to women who need it most, it has not been specifically assessed among Indigenous women. Regardless of which method is used, providing Indigenous women with access to culturally appropriate services and support to complete the screening pathway is critical. Otherwise it is likely that current geographical variations will remain.

Limitations

Limitations include the reliance on the accuracy of self-reported residential information, and challenges in generating Indigenous population estimates in small areas that form the denominator for participation rates. There was often high uncertainty around the LGA-specific estimates, requiring some caution with interpretation and meaning that some of the observed variation may be due more to random variation than a real difference. Determining Indigenous status among the cohort is not a precise science, especially with the dependence on complete data linkage and notifications to the

public hospitals. The impact of these limitations may be magnified when considering small geographical areas.

Conclusions

The findings presented in this report highlight the importance of continued monitoring of cervical cancer screening participation at the local area level, ongoing efforts to identify drivers of these patterns and developing effective strategies to improve participation and potentially reduce the cervical cancer burden among Indigenous women.

Acknowledgments

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Gail Garvey and Lisa Whop were supported by the respective NHMRC Early Career Fellowships (#1105399 and #1142035).

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ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ASGS	Australian Statistical Geography Standard
ASR	Age Standardised Rate
cHGA	Cytology detected high-grade abnormality
cLGA	Cytology detected low-grade abnormality
CI	Confidence interval
EB	Empirical Bayes
EBS	Empirical Bayes smoothers
ERP	Estimated resident population
HGA	High-grade abnormality
hHGA	Histologically confirmed high-grade abnormality
HHS	Hospital Health Service
HPV	Human Papillomavirus
IRSAD	Index of Relative Socio-economic Advantage and Disadvantage
IQR	Interquartile Range
LGA	Local Government Area
NCSP	National Cervical Screening Program
NHMRC	National Health and Medical Research Council
NICSP	National Indigenous Cervical Screening Project
PHN	Primary Health Network
PSR	Pap Smear Register
RA	Remoteness Area
SEIFA	Socio-economic Indexes for Areas
SES	Socioeconomic Status

Introduction

Since the inception of the National Cervical Screening Program (NCSP) in Australia in 1991, cervical cancer incidence and mortality rates have halved in women aged at least 25 years, (1, 2) and are now among the lowest worldwide. (3) However, Aboriginal and Torres Strait Islander women (henceforth respectfully referred to as Indigenous women) continue to experience a disproportionately greater burden of cervical cancer. (1, 4) National data on the standard performance measures of the NCSP for Indigenous women, including participation, are currently lacking as pathology report forms, the primary source of information for the state-based Pap Smear Register (PSRs), do not routinely record Indigenous status. (1) While some localised studies have reported that women from remote and rural Indigenous communities in Queensland (5) and the Northern Territory (6) generally had lower participation rates in cervical cancer screening than state or territory totals, these studies provide no information on participation rates by Indigenous status at the population-level. The NHMRC-funded National Indigenous Cervical Screening Project (NICSP) is using probabilistic record linkage methods to combine population-based administrative databases to identify women in the PSR who are Indigenous. This approach would allow an assessment of the cervical screening program by Indigenous status. (7)

Analyses are still underway from a national perspective; however results for the Queensland-specific cohort (7) showed that Indigenous women had consistently lower participation rates over all age groups, (8) higher prevalence of cervical abnormalities among screened women (9) and lower rates of clinical follow-up within two months of a high-grade abnormal Pap test than non-Indigenous women. (10) Although these differences were evident across categories of residential remoteness and disadvantage, these broad categories combine areas of heterogeneous characteristics and location, thus limiting any insights into the local drivers of the observed patterns.

Investigation of small area patterns in health-performance measures can be useful in highlighting areas of poorer outcomes and uncovering localised variations that may be masked by larger area estimates. (11)

1.1 Aims

The aims of this study were to investigate the geographical variation among Indigenous and non-Indigenous women in cervical cancer screening participation rates, prevalence of histologically confirmed high-grade abnormalities and rate of clinical investigation within two months of a high-grade abnormal Pap test among female residents of Queensland between 2006 and 2011.

Methods

Ethics approval was obtained from the Human Research Ethics Committees of Queensland Health (HREC/15/QCH/19-957), the Northern Territory Department of Health and Menzies School of Health Research (HOMER-2012-1737) and Charles Darwin University (H12093). Data access and linkage were approved by the Director-General of Queensland Health, relevant data custodians and the Queensland Research Linkage Group.

This project is a subcomponent of the NICSP. Full details of the data extraction and record linkage processes have been published previously. (7) Briefly, to overcome the lack of Indigenous status information on the

Queensland PSR, record linkage with the Queensland Hospital Admitted Patient Data Collection was undertaken to identify those Pap tests carried out on Indigenous women. Information on cervical cancer diagnosis date, which was required for analysis of time to clinical investigation, was obtained through additional linkage with the population-based Queensland Cancer Registry.

The current geographical analysis utilised this retrospective cohort, focussing on the details of cervical screening participation and related outcomes for Indigenous and non-Indigenous women aged 20-69 years in Queensland from 2006 to 2011. The cohort included 1,091,747 women, of whom 2% were Indigenous. Analyses were conducted using Stata/SE (Version 14.2; Stata Corporation, College Station, TX) and the public-domain executable ("poisson_kriging.exe") (12) for the smoothing of small-area estimates. Maps were created using MapInfo Professional (version 15.0, Pitney Bowes, Stamford CT).

2.1 Geographical areas

Residential suburb and postcode at the time of each Pap smear were mapped to the 2014 Queensland Local Government Area (LGA) boundaries (to match population estimates, with 2014 and 2015 boundaries being the same for Queensland), using a population-weighted correspondence obtained from the Australian Bureau of Statistics (ABS). (13) If the address information was insufficient to assign the LGA for a specific Pap smear record, then information from the closest available record for the same woman, with viable address information, was used. Women with insufficient address information for all records (n=487, 3% of whom were Indigenous) were excluded.

LGAs are administrative units that sit within the Australian Statistical Geographic Standard (ASGS). (14) In 2015, there were 78 LGAs in Queensland, of varying land area (median area 7230 km^2, range: 11 to 105,782 km^2) and population (median: 7,670, range: 290 to 1,165,914) that covered the entire state without gaps or overlaps. (15) (Appendix 1, Figure A1.1)

In addition, estimates for larger geographical regions were considered: the seven Queensland Primary Health Networks PHN, Figure A1.2), (16) and fifteen Queensland Hospital Health Service (HHS, Figure A1.3) regions. (17) The population-weighted correspondence files and area-based digital boundaries required to assign each LGA to the appropriate PHN (n=7) and HHS (n=15) were obtained from the Australian Government (16) and Queensland Government respectively. (17)

2.2 Estimated resident populations

Published LGA-specific population estimates of women in Queensland by Indigenous status (18) were available by five-year age groups from 20 to 64 years, but combined all ages from 65 years and over. We therefore used Indigenous population estimates for total Queensland (by 5-year age groups, up to 85+ years), (19) to estimate the year-specific proportion of women aged 65+ who were aged 65-69. These state-based proportions were then multiplied by the LGA-specific Estimated Resident Populations (ERP) for the 65+ age group to estimate the ERP by LGA and Indigenous status for the 65-69 years age group for each year. Although we had no objective data supporting the validity of this assumption, during the study period Indigenous women aged 65-69 years comprised around 2% of the Queensland Indigenous female population aged 20-69 years, while the corresponding proportion for non-Indigenous women was 6%. Hence, the

population of women aged 65 to 69 years was not expected to be a major contributor to the overall population denominator used for calculating participation rates.

The appropriate population (denominator) data for the participation rates would be women who have not had a hysterectomy. To incorporate this, the standard ERPs were adjusted by applying age-specific hysterectomy fractions derived from the National Hospitals Morbidity Database. (1) Since separate fractions are not available by geographical location or Indigenous status, the same fractions were used across all LGAs for both Indigenous and non-Indigenous women. While the incidence of hysterectomies may be lower among Indigenous than non-Indigenous women, (5, 20) the impact of this in this cohort would be minimised by the younger age distribution among Indigenous (66% aged < 40 years) versus non-Indigenous (53% aged <40 years) women, and the lower hysterectomy rates among younger age groups. (1)

The corresponding population-estimates for larger geographical areas (PHN, HHS) were calculated as an aggregate of included LGA's.

2.3 Outcome measures

Pap smear participation rates

Low counts across the different strata precluded the calculation and reporting of two-year participation rates. Five-year participation rates were calculated by dividing the number of eligible women aged 20 to 69 who underwent screening at least once within a five-year time-period (2007-2011) by the population of eligible women, and expressed as a percentage. When a woman had more than one Pap smear within a specific interval, only the first Pap smear was included. Rates were calculated by LGA for each five-year age group (20-24, 25-29,…, 65-69 years) separately for Indigenous and non-Indigenous women. These rates were then age-standardised to the 2001 Australian female population for the combined age group (20-69) and broad age groups (20-49, 50-59 and 60-69) to account for the underlying differences in age-structure between Indigenous groups, geographical areas, calendar year or broad age groups.

Three-year-age-standardised rates were also calculated for the time-periods 2006 to 2008 and 2009 to 2011 for all ages combined.

Prevalence of histologically confirmed high-grade cervical abnormalities

Consistent with current national reporting guidelines, (1) a high-grade cervical abnormality was a cytological (Pap smear) result that detected a cervical intraepithelial lesion of grade 2 or higher, adenocarcinoma in situ, or invasive cancer. Women were considered to have a histologically confirmed high-grade abnormality (hHGA) if there was a record of a high-grade intraepithelial abnormality or malignancy confirmed through biopsy within six months (183 days) of a Pap smear. (9) Women with an hHGA report but no recorded cytology tests within the previous six months were excluded as these tests may have resulted from diagnostic investigations other than cervical screening.

The prevalence of histologically confirmed high-grade abnormalities was calculated by dividing the number of such abnormalities in a given time-period and geographical area (numerator) by the number of screened women for the same time-period living in that area (denominator). Prevalence estimates were directly age-standardised to the 2001 Australian female ERP (per 1000 screened women) and stratified by Indigenous

status. Due to low numbers across various strata, only five-year prevalence rates for 2007 to 2011 for all ages combined are shown by LGA.

Rate of clinical investigation within two months of cytological high-grade abnormalities

Current guidelines (21) recommend clinical investigation with diagnostic tests, (primarily histology) within two months of a cytological (Pap smear) detected high-grade abnormality (cHGA). However, Indigenous women were recently reported to be less likely to undergo clinical investigation within the recommended follow-up period following a cHGA than non-Indigenous women for Queensland. (10) Hence the third outcome to be analysed was whether there were regional variations in rate of clinical investigation within two months of a cHGA result between non-Indigenous and Indigenous women in Queensland.

The cohort for this analysis was restricted to women aged 20 to 68 years (for consistency with previously published estimates for total Queensland), (10) who had a first (index) cHGA (defined as predicted cervical intraepithelial lesion of grade 2 or higher, adenocarcinoma in situ, or invasive cancers) Pap smear between 1st January 2006 and 31 December 2009.

Clinical investigation was defined as a histology test or cancer diagnosis. Time to clinical investigation was calculated as the time (in days) from the index smear to the first recorded clinical investigation, with this information available until 31 December 2010. Women who had an investigation before or on the same day as the index smear were excluded as the investigation was likely to have been related to gynaecological symptoms.

Rates of clinical investigation were calculated as the number of women followed-up within two months of a cHGA result divided by the estimated number of women with a cHGA index Pap smear between 2006 and 2009 for the same area (denominator). Rates were directly age-standardised to the 2001 Australian female ERP (per 100 women). Small numbers precluded the calculation of these estimates by age group.

2.4 Spatial mapping

Given the larger populations involved, the age-standardised estimates by broad geographical areas (i.e. PHN, HHS) are considered sufficiently robust for reporting purposes. However, when considering the estimates by LGA, the age-standardised estimates can fluctuate widely for sparsely populated areas (denominator) and/or when there are low numbers of women being screened (numerator). For this reason, spatial smoothing was used to “borrow” information from surrounding areas when calculating the estimates by LGA, and so reduce the extent of these typically spurious fluctuations. Smoothing produces more reliable and robust estimates, by reducing uncertainty in the estimates for areas with sparse data while reflecting underlying spatial patterns in estimated rates. (11)

Two common approaches for smoothing in disease mapping are Bayesian statistical modelling (22) or geostatistical methods (12). Commonly, statistical models use a Bayesian approach, (22) however, the standard approaches within the fully Bayesian framework are not generally suited to modelling age-standardised rates, and the strong smoothing effects of standard Bayesian models can reduce their ability to detect localised differences. (11, 23) Therefore, in these analyses we focused on geostatistical smoothing, considering rates of smoothing based on population-weighted averages, Empirical Bayes (EB) smoothers

(both global and local averages) and Poisson Kriging, the latter of which yields the posterior distribution of risk (similar to a Bayesian model), but ignores the uncertainty in the correlation function parameters. (12)
Initial sensitivity analyses found that the estimates generated by local EB, global EB or Poisson Kriging approaches were similar. Empirical Bayes local smoothers were preferred as this approach shrinks estimates towards a local area means rather than a general state-wide average. This assumes that areas close to each other are more likely to have similar characteristics. During the smoothing process the risk over an area is estimated as a weighted sum of the rate observed for both that area and the local mean for surrounding areas. As the population of a given LGA becomes smaller, more weight is assigned to the local area mean than the LGA-specific estimate. (12, 24) Refer to Goovaerts (12) for a detailed description of the methods and formulae.
Our investigation of the optimum parameters for the spatial smoothing found the default parameters (12) were most effective, except that the maximum neighbours was set to be 20 and the maximum search window to be 500 km. In practice, the maximum effective distance for spatial dependence ranged from around 200 to 280 km for local smoothing.
An example of the impact that smoothing had on the LGA-specific five-year participation rates is presented in Appendix 2 (Figure A2.1).

2.5 Presentation of estimates

Smoothed estimates of the rates are presented as maps with an oval inset depicting the magnified south-east region of Queensland. These maps capture the magnitude of the spatial variation across LGAs but ignore the level of uncertainty.
To supplement the information provided in the maps, graphs showing the ranked smoothed rate with associated 95% confidence intervals (CIs) (determined from the corresponding mean standard error estimated using a linear iterative procedure) for each LGA were generated. (12) Separate maps and graphs are shown for Indigenous and non-Indigenous women for each outcome.

Results

The initial cohort consisted of 1,091,747 women (2% Indigenous) who underwent a Pap smear (2,395,657) between 1 January 2006 and 31 December 2011. After excluding 487 women (n =15, 3% of whom were Indigenous) who had missing or non-Queensland residential location for all their records (1,949 Pap smears), the final dataset for the analysis of participation rates and prevalence of hHGA consisted of 1,091,260 women with 2,393,708 Pap smears. Of these, 21,748 (2%) women were identified as Indigenous with 44,815 Pap smears.

3.1 Pap smear participation rates

Estimated Pap smear participation rates by Indigenous status for overall Queensland and by broad age group (Table 1) highlight the differential in participation rate between Indigenous and non-Indigenous women. This difference was consistently evident across different time-periods and age groups.

Table 1 Age-standardised Pap smear participation rates, by Indigenous status, time-period and broad age group, Queensland

	Non-Indigenous		Indigenous	
	ASR/100	95% CI	ASR/100	95% CI
Three-year participation rate by time-period (aged 20-69 years)[1,2]				
2006-2008	69.8	[69.7, 70.0]	43.2	[42.4, 43.9]
2009-2011	68.3	[68.2, 68.5]	41.8	[41.1, 42.5]
Five-year participation rate by age group (2007-2011)[1,2]				
20-39	84.1	[83.9, 84.3]	53.7	[52.7, 54.7]
40-59	80.1	[79.9, 80.4	47.9	[46.7, 49.2]
60-69	61.2	[60.8, 61.6]	43.6	[40.7, 46.6
20-69 combined	79.7	[79.5, 79.8]	50.1	[49.3, 50.8]

ASR Age-standardised participation rate, CI Confidence interval

1. Pap smear participation rate is the number of women screened at least once in each specified time-period and age group divided by the averaged estimated eligible resident female population for the same time-period and age group, age-standardised to the 2001 Australian standard population. Women who have had a hysterectomy are excluded from the eligible population. Please see text for further details.
2. Periods covered apply to calendar years.

Five-, three- and two-year age-standardised participation rates (with 95% CI) by Indigenous status are presented by PHN (Figure 1) and HHS (Figure 2) for the latest time-period, with the corresponding tabulated data shown in Appendices 3 and 4. Again, the inequality in participation rates was consistent across the PHNs and HHS, with Pap smear participation rates among non-Indigenous women being substantially higher than for Indigenous women. Even though there was some variation around these estimates (Appendices 3 and 4), the non-overlapping confidence intervals for Indigenous and non-Indigenous point estimates across all the PHN (Figure 1) and HHS (Figure 2) areas highlighted the significant differential by Indigenous status in participation rates across all time-periods and regions.

There was also some evidence that in certain areas, notably the Gold Coast (both PHN and HHS) the inequality was even greater than the state average. For example, Indigenous women aged 20 to 69 years living in the Gold Coast PHN had a five-year participation rate of 24.5 (per 100 women, 95% CI 22.1-27.2) compared to 85.7 (per 100 women, 95% CI 85.2-86.1) for non-Indigenous women. While the Pap smear participation rate among non-Indigenous women was relatively stable (for example the five-year participation rates among PHNs ranged from 79-87% - Table A3.1), there was much greater variation among Indigenous women (24-55%). (Table A3.1) Similar patterns were observed for the HHS regions, with the Gold Coast again having the lowest Pap smear participation rates (24%) while Cairns and Hinterland (ASR 56.1 per 100 women, 95% CI 54.2-58.0) and Torres and Cape (ASR 68.5 per 100 women, 95% CI 65.9-71.2) were higher than the state average. (Table A4.1).

Finally, when either PHN or HHS were broadly ordered by latitude, there was some suggestion that the participation rates for Indigenous women reduced on moving from North Queensland to the South-East corner of the state.

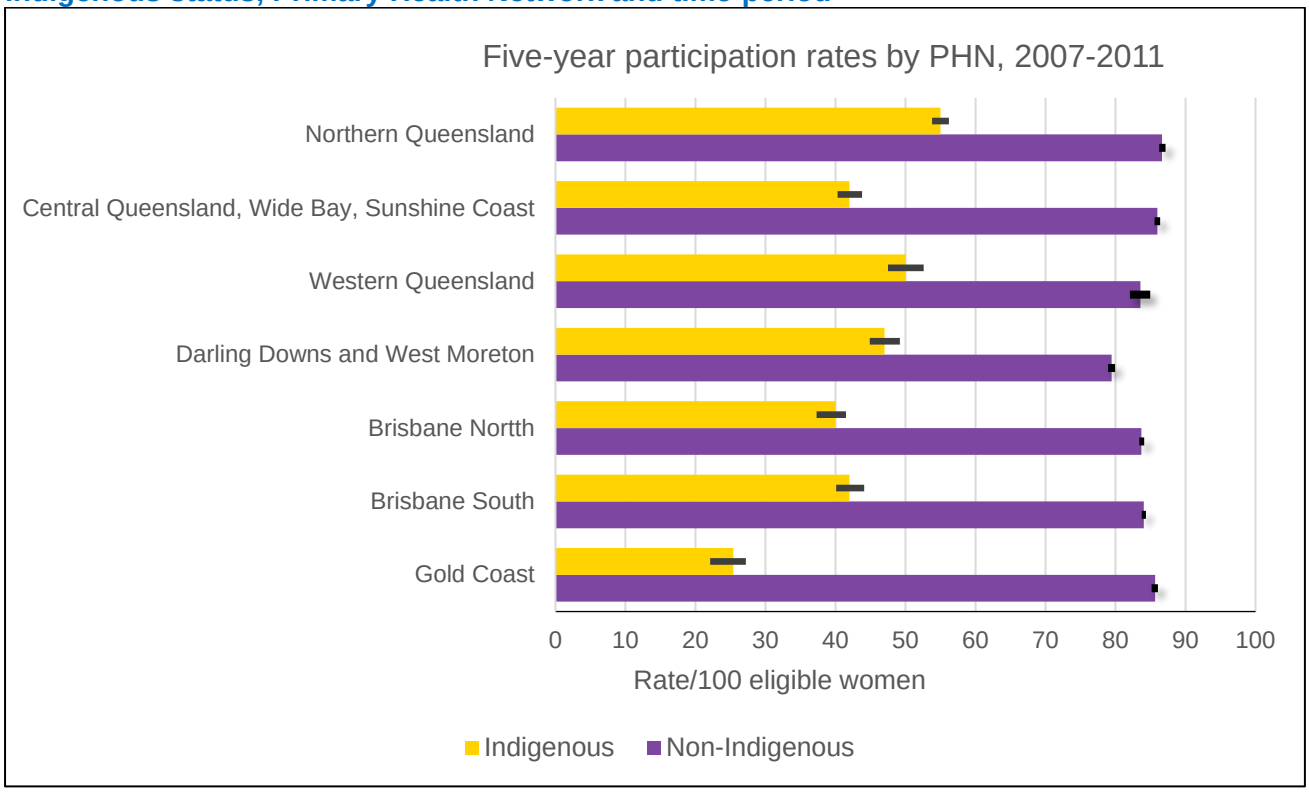
Maps (Figure 3) of the smoothed five-year Pap smear participation rates by LGA for all ages combined highlight the consistently high five-year participation rates among non-Indigenous women and the generally lower rates and wider geographical variation among Indigenous women. Similar patterns were shown by broad age group (Figure 4, Figure 5, Figure 6), with the absolute participation rates decreasing among both non-Indigenous and Indigenous women as age increased. Indigenous women also had lower three-year participation rates than non-Indigenous women for both screening periods. (Figure 7, Figure 8)

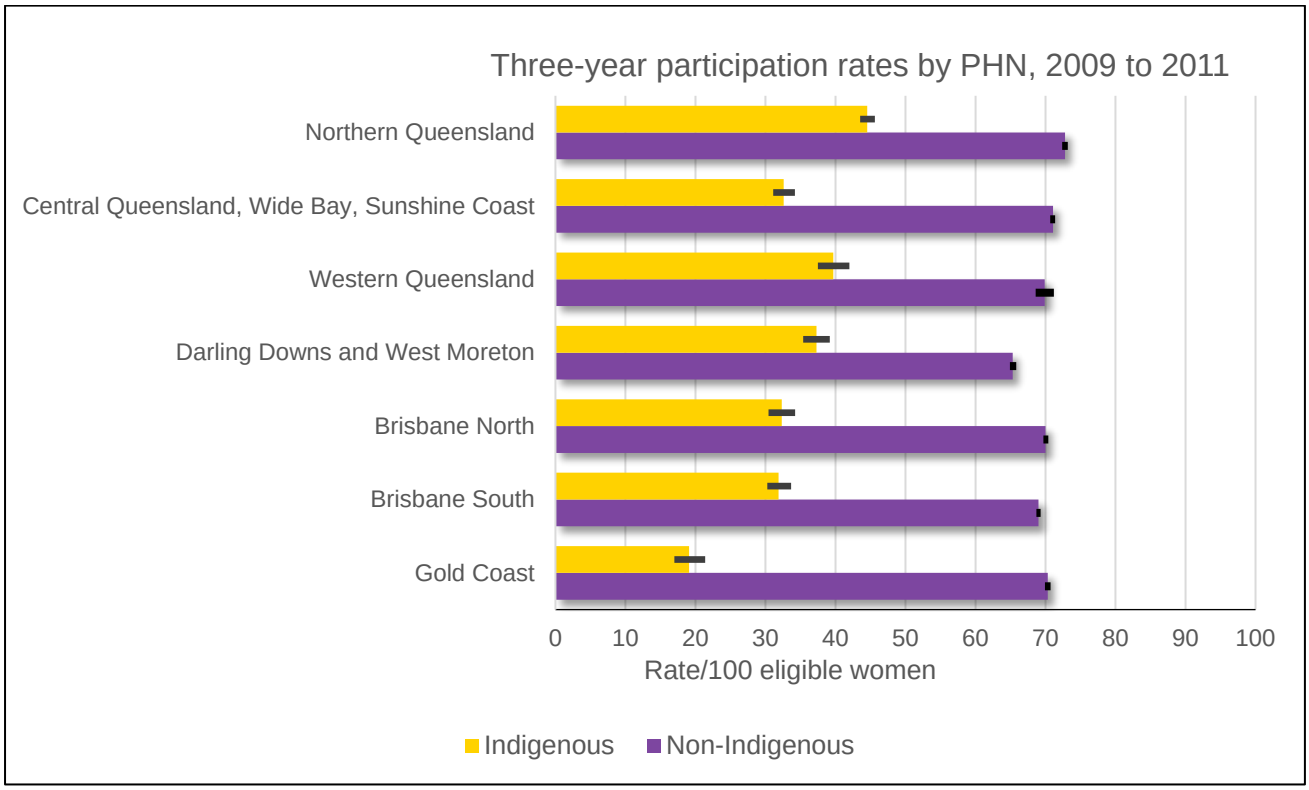
There was some evidence that Indigenous women from Far North Queensland had higher participation rates while those from the Gold Coast region in the South East had lower rates than the average participation rate for Indigenous women in Queensland.

Corresponding graphs (Figure 3) for the precision of the mapped estimates indicated that the smoothed overall five-year rates for non-Indigenous women were relatively stable (interquartile range (IQR) 80.7-85.3 per 100 eligible women) with narrower CIs than for Indigenous women (IQR 38.9-53.3). These differences were especially marked for the lowest ranked LGAs, with non-overlapping confidence intervals suggesting significant differences by Indigenous status. While there was also some evidence that the differences by Indigenous status in five-year participation rates for women aged 20-49 years were significant (Figure 4, Figure 5), the smaller counts for women aged 60-69 was reflected in the larger uncertainty around the corresponding estimates for both groups of women. (Figure 6)

Graphs of the confidence intervals for the ranked mapped LGA-specific estimates of the three-year participation rates across both time-periods indicated that the differences by Indigenous status were significant with greater variability in the rates for Indigenous women. (Figure 7, Figure 8)
Additional maps showing the five-year participation rates for the Torres region are also provided. (Figure 9)
For context, a map of the ERP used as the denominator in calculating participation rates by LGA is also shown. (Figure 10) For additional context, the number of women screened over five-years (2007-2011) by LGA and Indigenous status along with the corresponding smoothed rates (with 95% CI) are tabulated in Appendix 5. (Table A5.1)
The effect of smoothing was to reduce the variability in area-specific estimates, with this effect most pronounced for areas with low counts and/or small population sizes. (Figure A2.1) For example, for Indigenous women, the IQR for the crude five-year participation rates per 100 eligible women (37.0-55.9) was wider than for the smoothed rates (IQR 38.9-53.3), as was also observed for non-Indigenous women (crude IQR 77.3-88.4 and smoothed IQR 80.7-85.3). For areas with sparse data, the smoothed estimates obtained by incorporating information from neighbouring areas were thus more stable and reliable reflecting increased precision in these estimates.

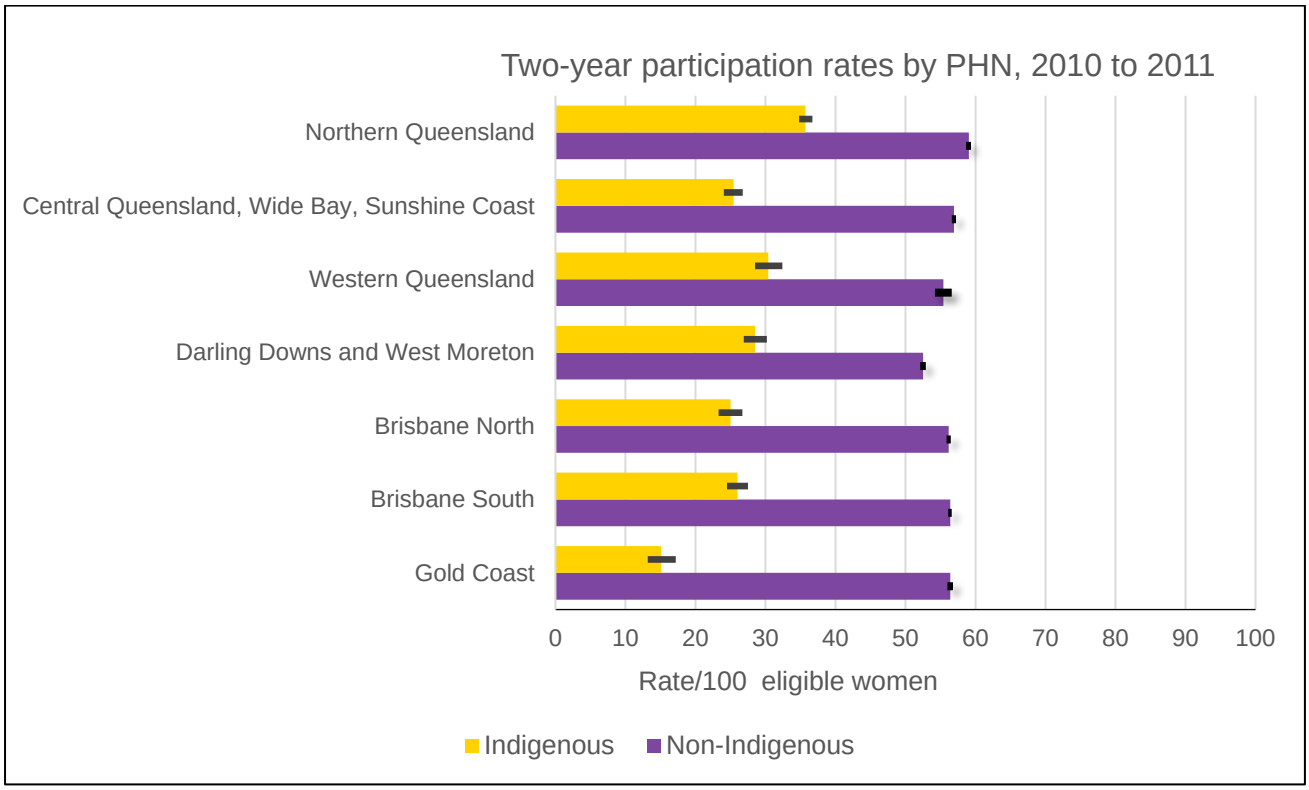
Figure 1 Age-standardised Pap smear participation rates for women aged 20-69 years, by Indigenous status, Primary Health Network and time-period





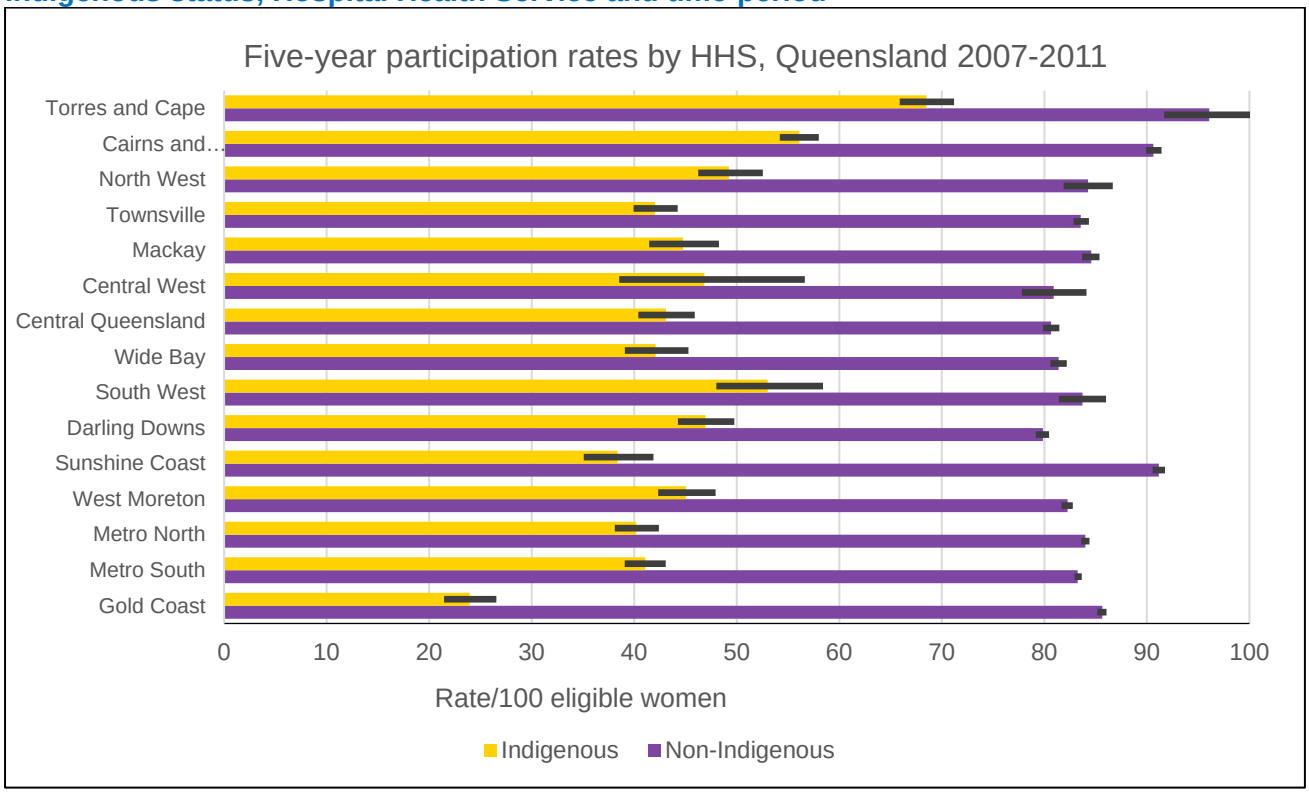
Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
PHN: Primary Health Network

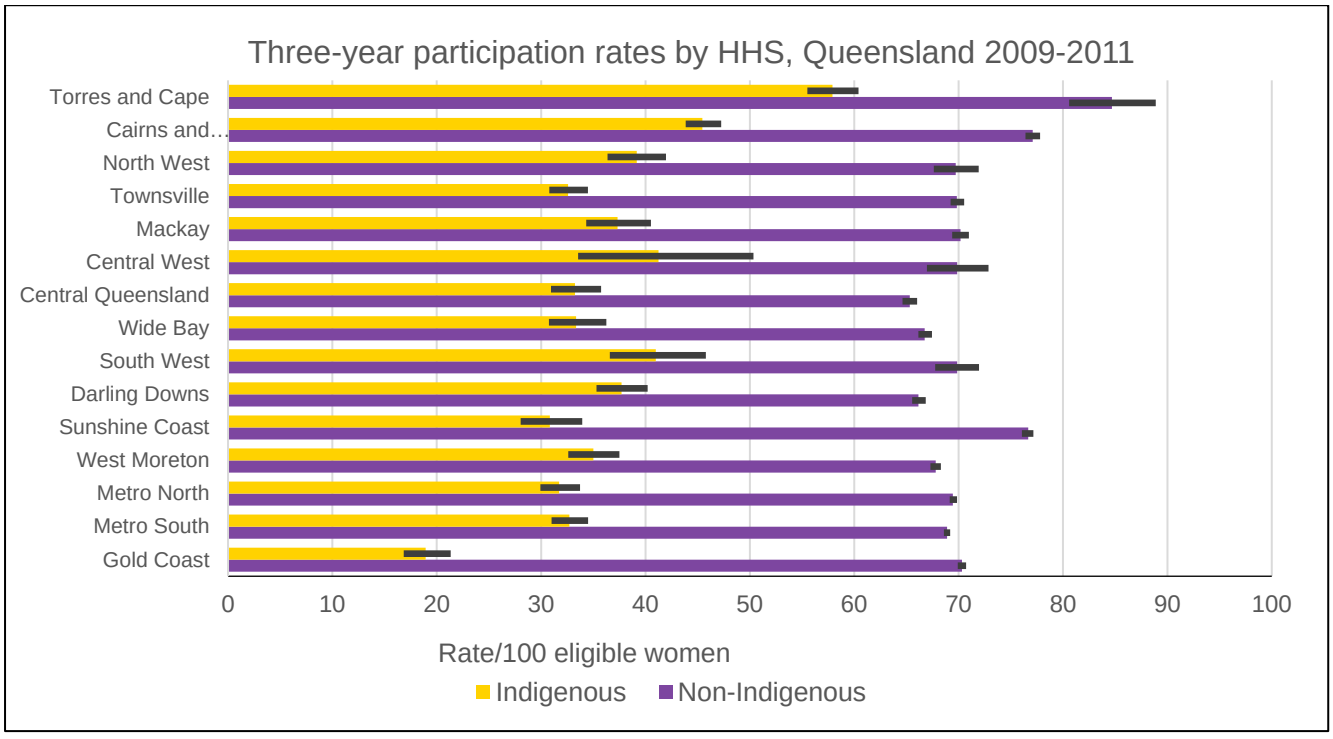
Figure 1 (continued) Age-standardised Pap smear participation rates for women aged 20-69 years, by Indigenous status, Primary Health Network and time-period



Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
PHN: Primary Health Network

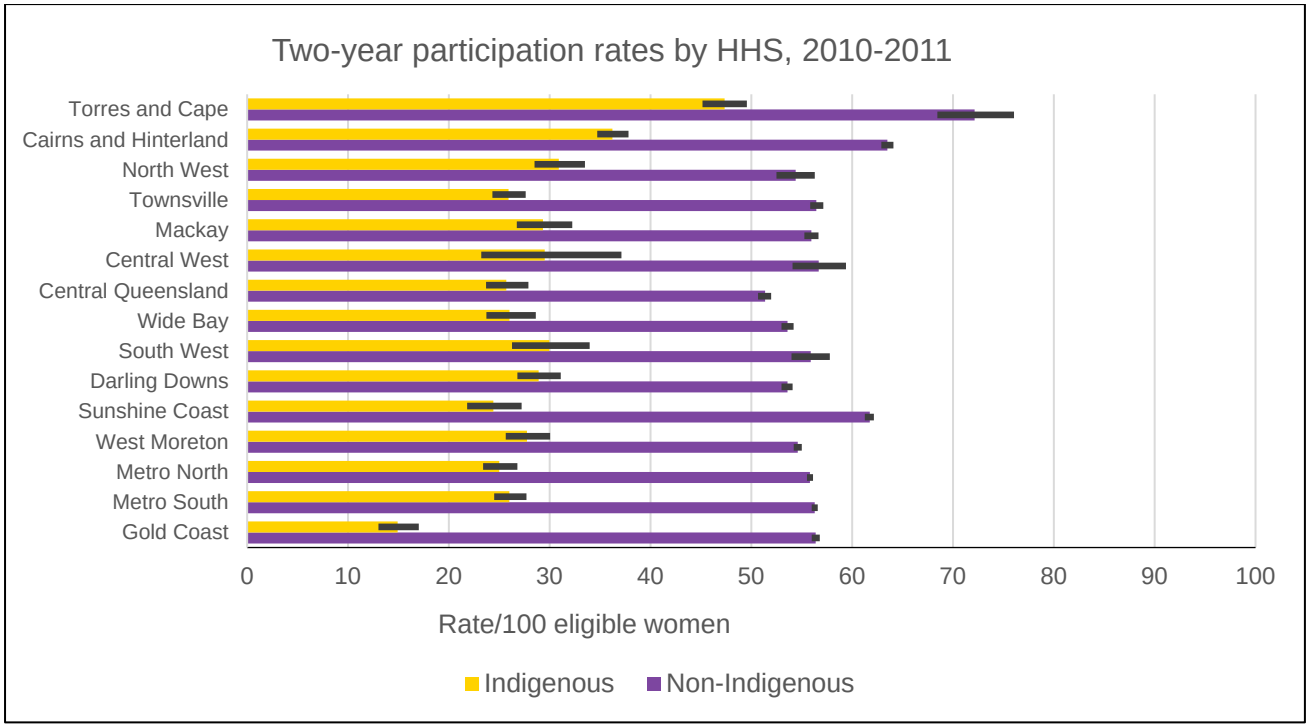
Figure 2 Age-standardised Pap smear participation rates for women aged 20-69 years, by Indigenous status, Hospital Health Service and time-period





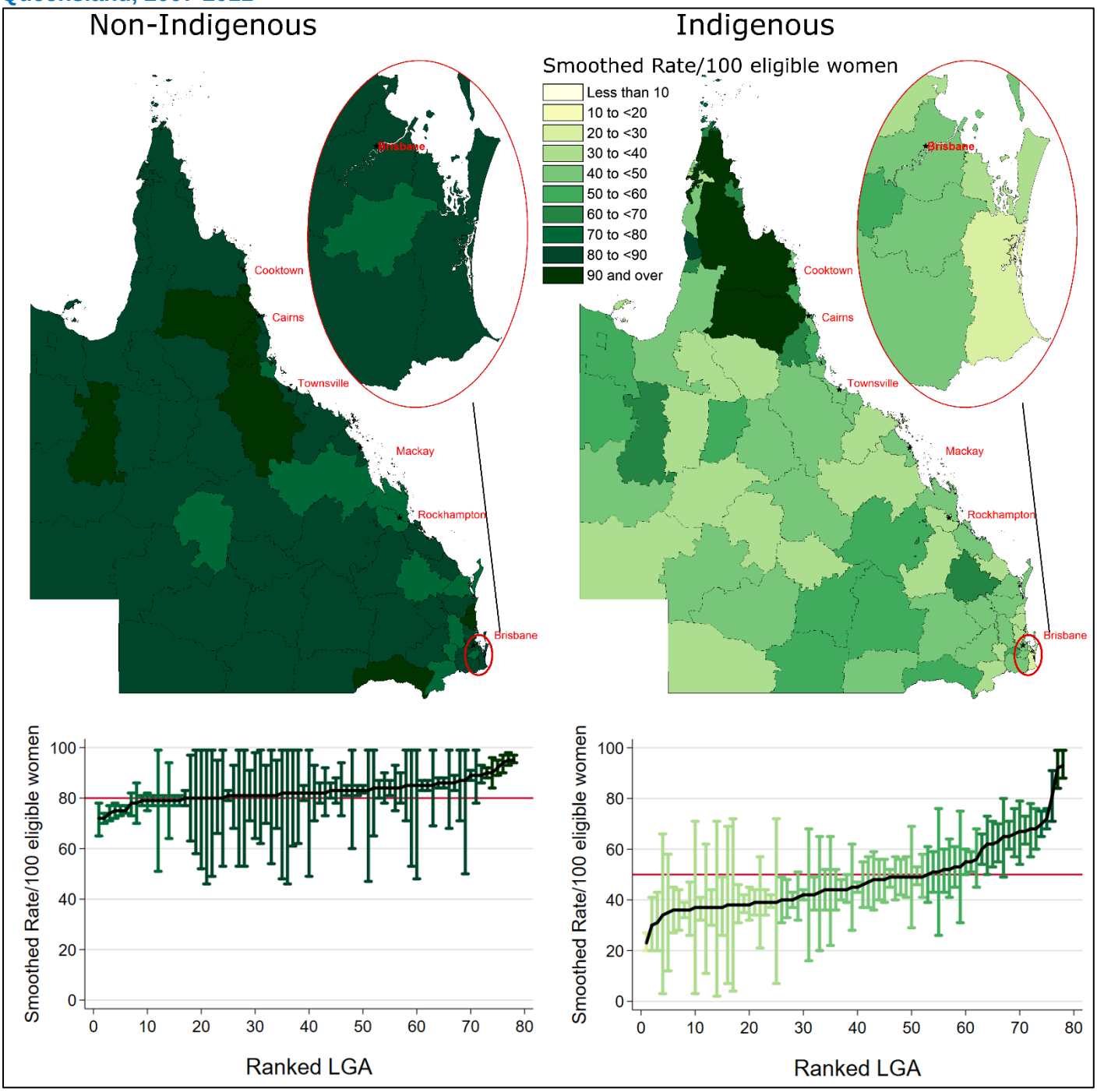
Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
HHS: Hospital Health Service

Figure 2 (continued) Age-standardised Pap smear participation rates for women aged 20-69 years by Indigenous status, Hospital Health Service and time-period



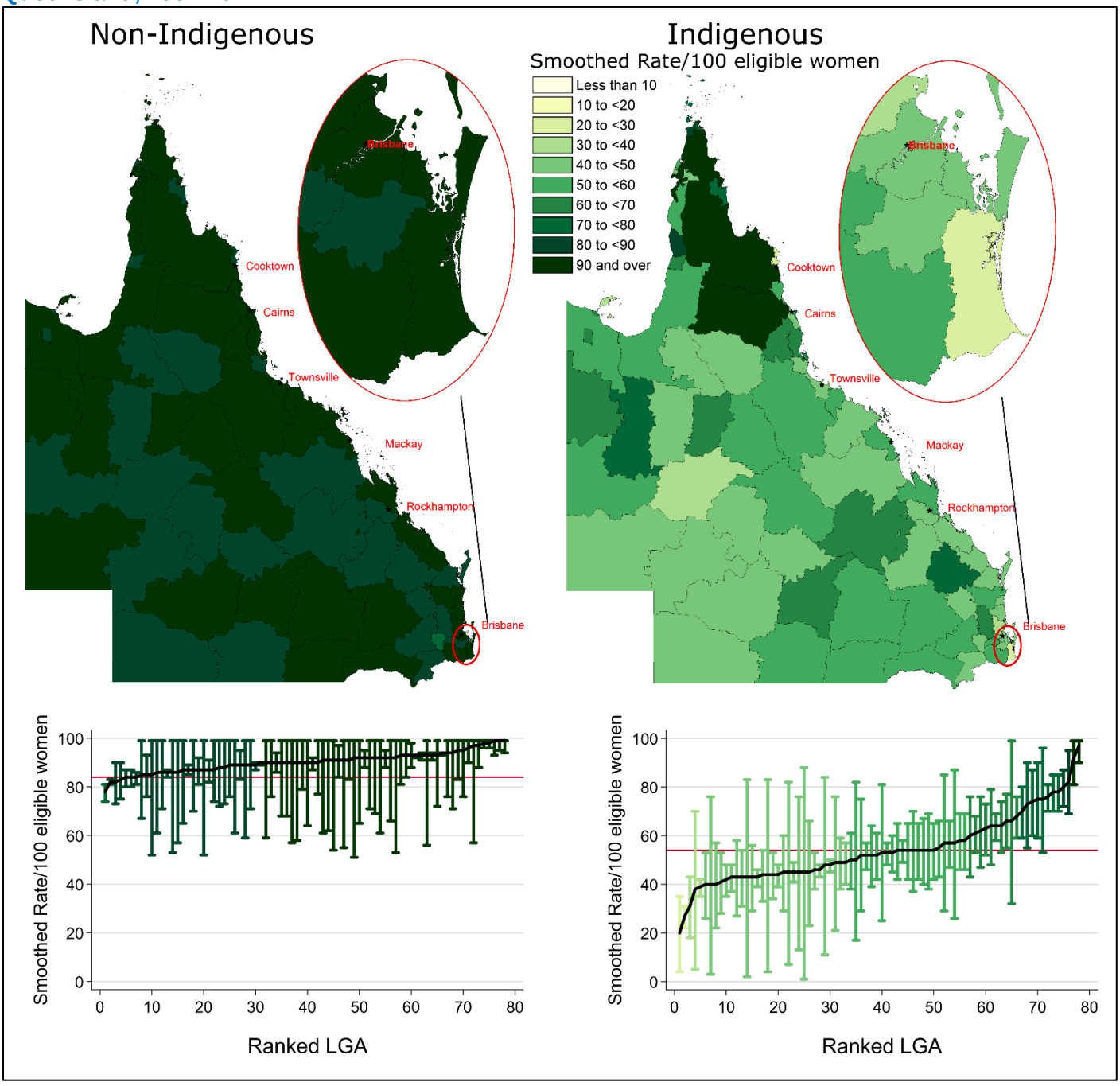
Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
HHS: Hospital Health Service

Figure 3 Locally smoothed five-year Pap smear participation rates for women aged 20-69 years, Queensland, 2007-2011



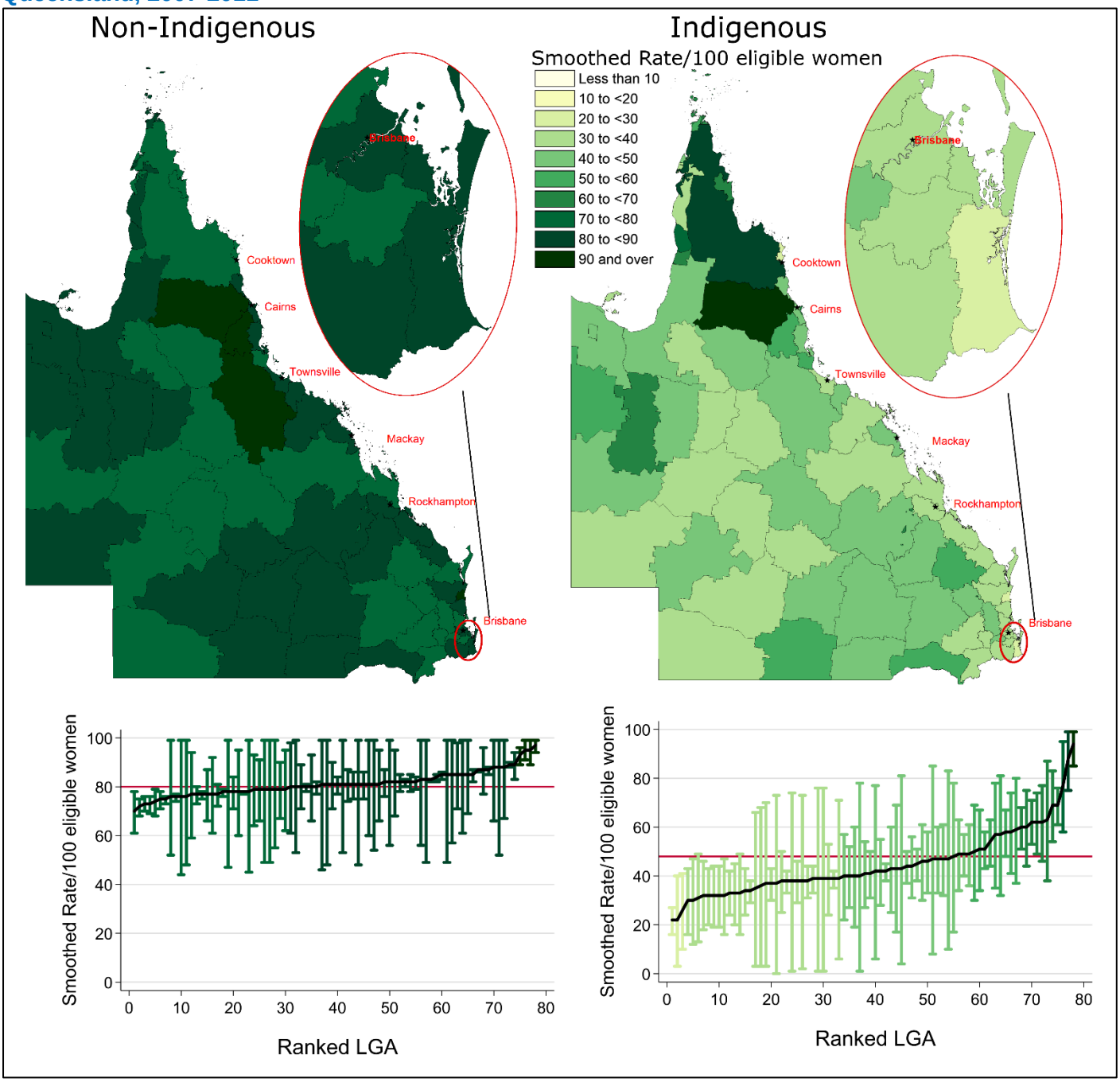
Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 4 Locally smoothed five-year Pap smear participation rates for women aged 20-39 years, Queensland, 2007-2011



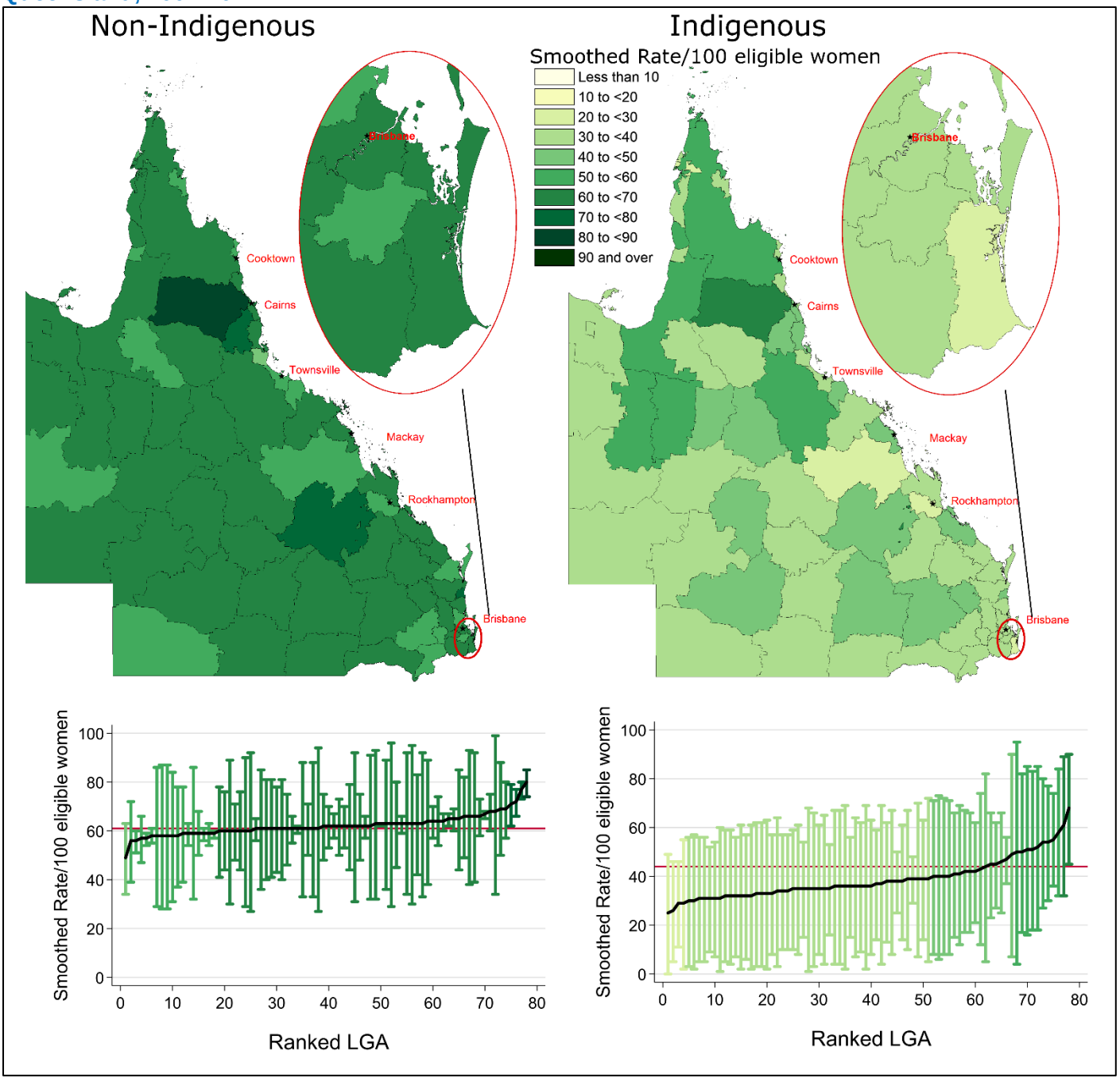
Notes:
Eligible women are women aged 20 to 39 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 5 Locally smoothed five-year Pap smear participation rates for women aged 40-59 years, Queensland, 2007-2011



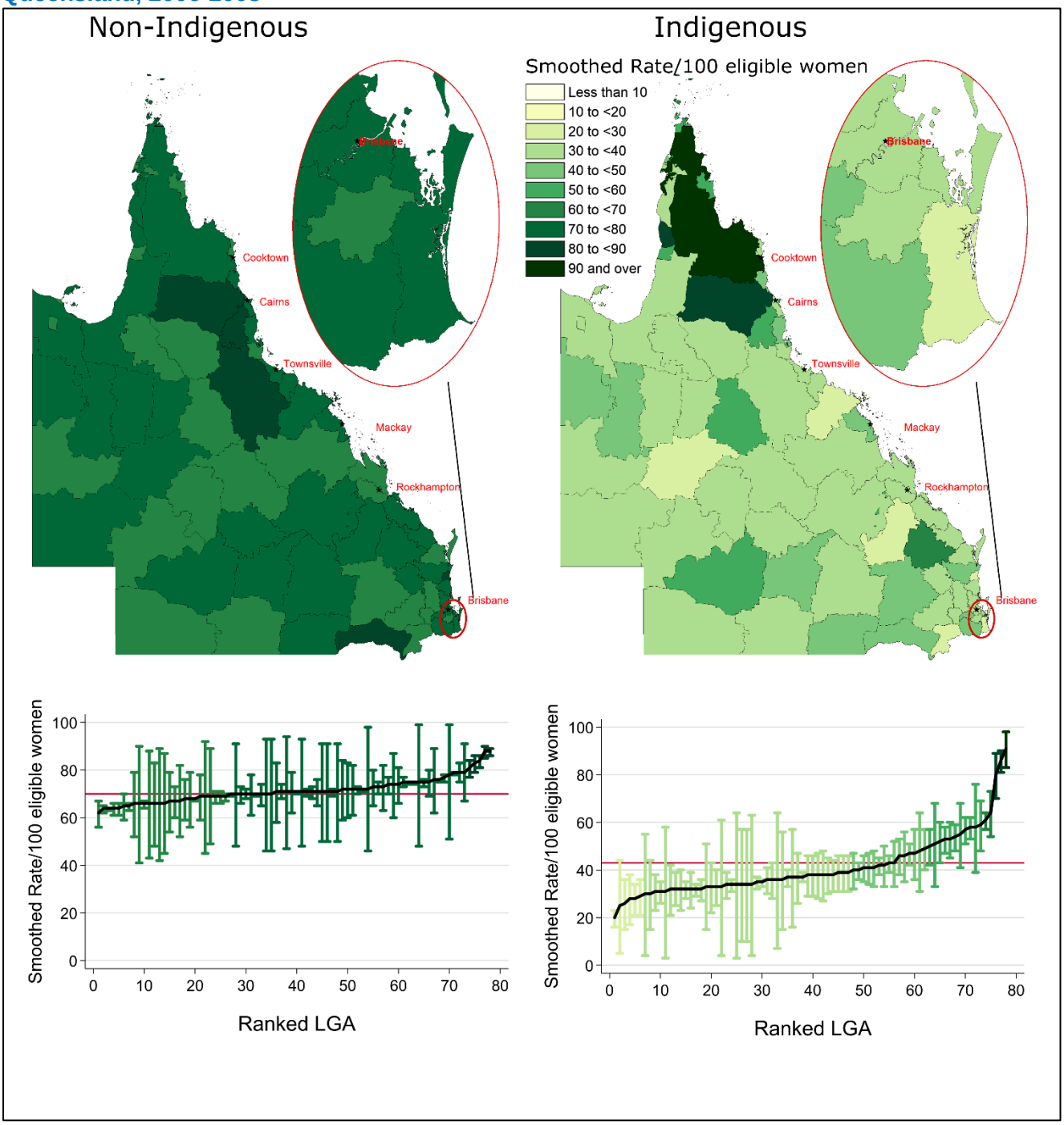
Notes:
Eligible women are women aged 40 to 59 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 6 Locally smoothed five-year Pap smear participation rates for women aged 60-69 years, Queensland, 2007-2011



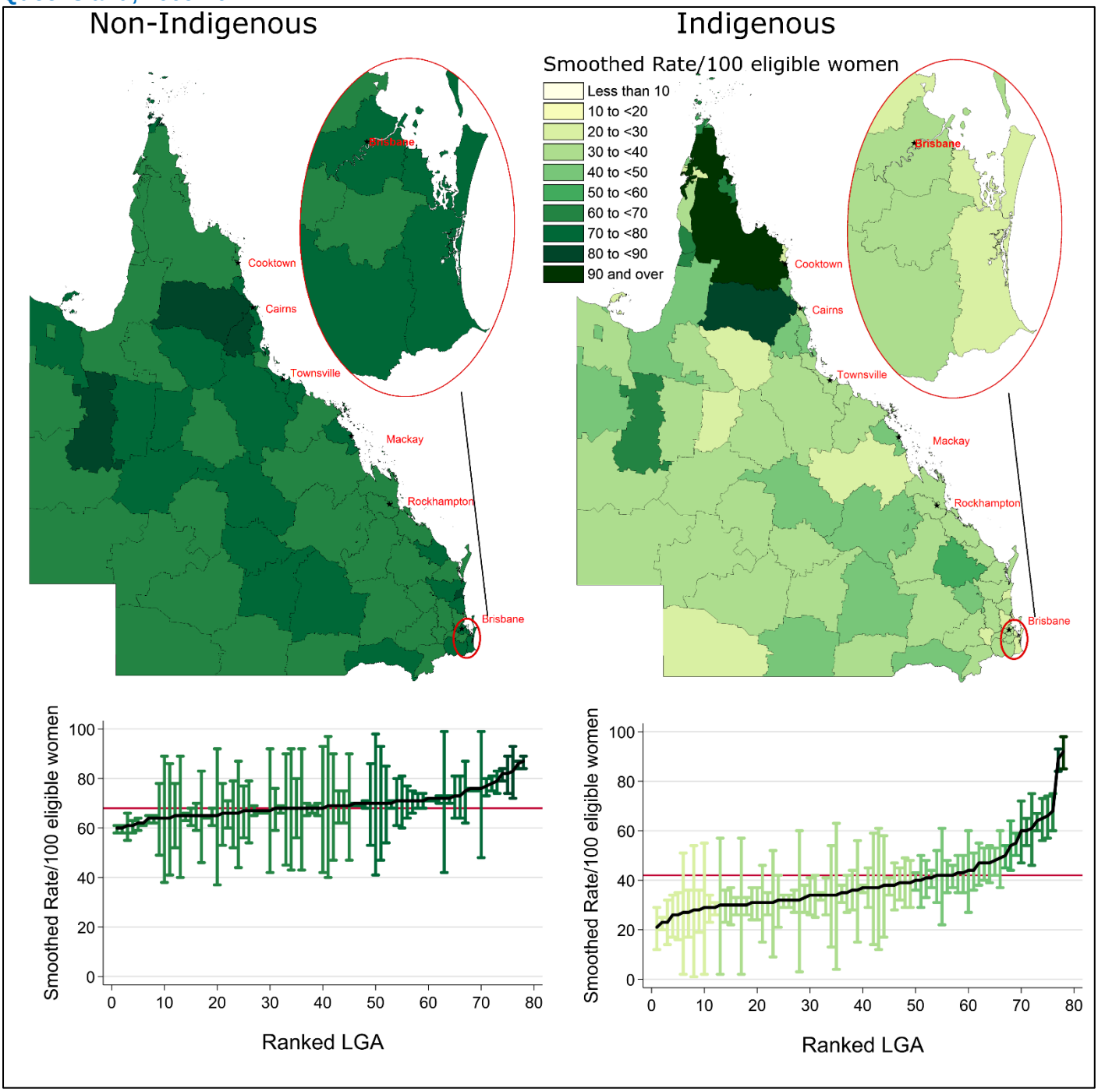
Notes:
Eligible women are women aged 60 to 69 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 7 Locally smoothed three-year Pap smear participation rates for women aged 20-69 years, Queensland, 2006-2008



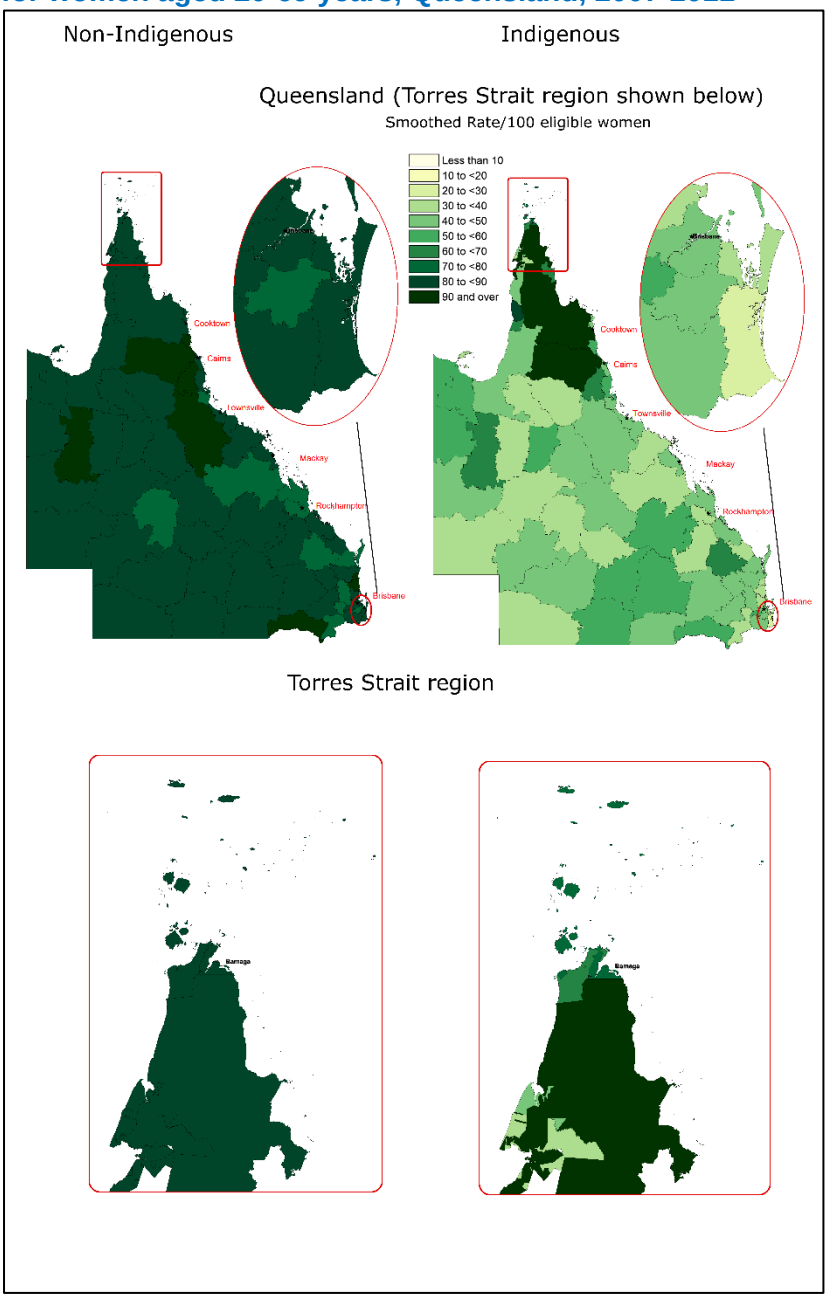
Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 8 Locally smoothed three-year Pap smear participation rates for women aged 20-69 years, Queensland, 2009-2011



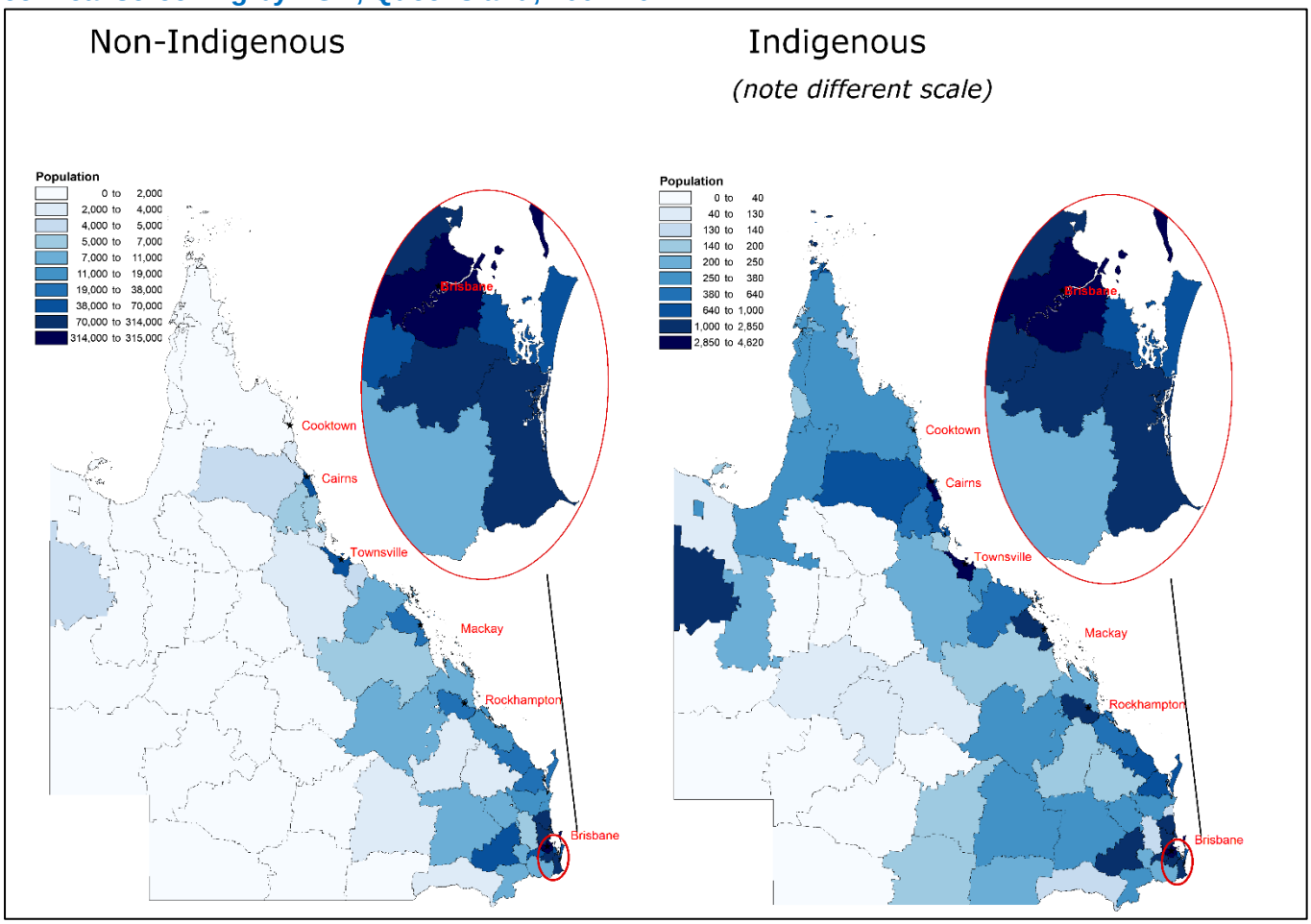
Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 9 Locally smoothed five-year Pap smear participation rates, with inset, Torres Strait region, for women aged 20-69 years, Queensland, 2007-2011



Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
Darker shades indicate higher participation rates.

Figure 10 Estimated resident population (ERP) of women aged 20 to 69 years eligible for cervical screening by LGA, Queensland, 2007-2011



Notes:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.
LGA: Local Government Area.

3.2 Prevalence of histologically confirmed high-grade cervical abnormalities

The overall prevalence of hHGA abnormalities from 2007 to 2011 among Indigenous women in Queensland (19.0 per 1000 screened women, 95% CI 17.4-20.7) was about twice that for non-Indigenous women (8.6 per 1000 screened women, 95% CI 8.5-8.8). The increase in abnormalities was only significant among non-Indigenous women, while prevalence rates were highest among younger women for both Indigenous and non-Indigenous women. (Table 2)

Table 2 Age-standardised prevalence of histologically confirmed high-grade cervical abnormalities, by Indigenous status, time-period and broad age group, Queensland

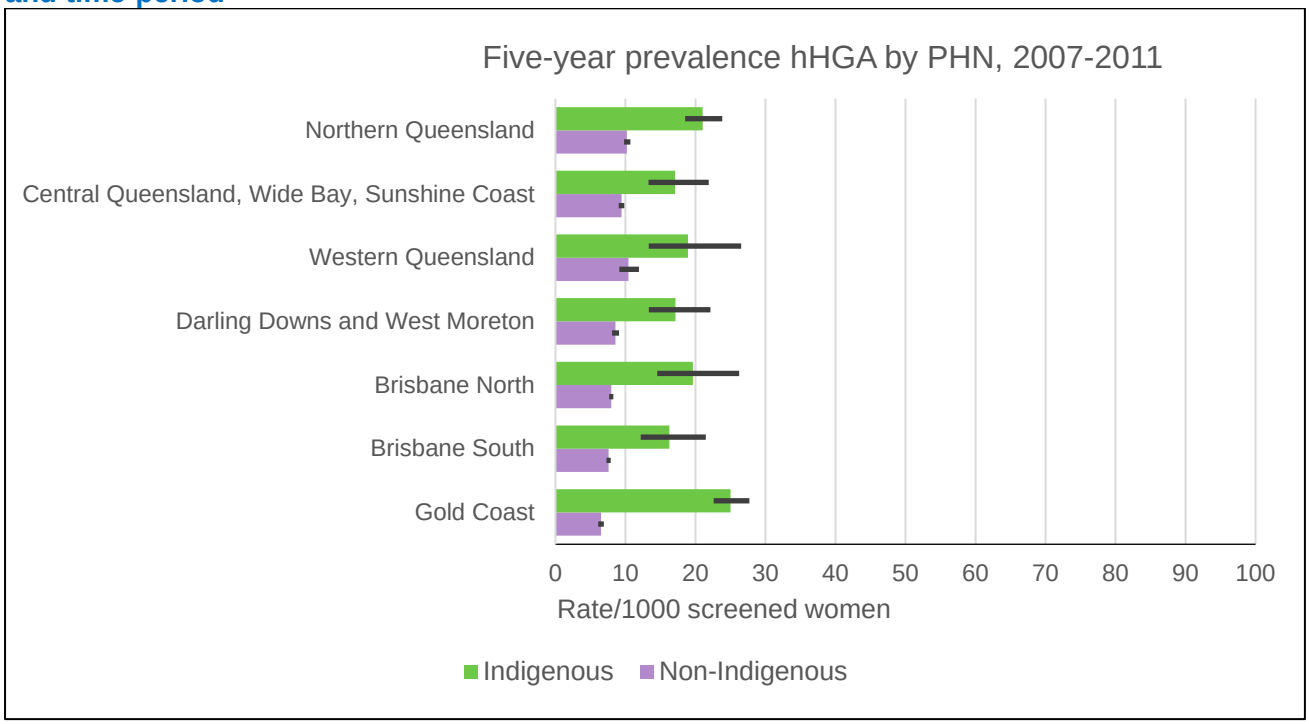
	Non-Indigenous		Indigenous	
	ASR/1000	95% CI	ASR/1000	95% CI
Three-year prevalence[1,2] hHGA by time-period (aged 20-69 years)[1,2]				
2006-2008	7.5	[7.3, 7.6]	16.7	[14.8, 18.7]
2009-2011	7.9	[7.8, 8.1]	17.7	[15.9, 19.7]
Five-year prevalence hHGA by age group (2007-2011)[1,2]				
20-39	14.9	[14.6, 15.2]	29.8	[27.3, 32.4]
40-59	3.7	[3.6, 3.9]	9.8	[7.8, 12.1]
60-69	1.9	[1.7, 2.2]	9.8	[5.0, 17.1]
20-69 combined	8.6	[8.5, 8.8]	19.0	[17.4, 20.7]

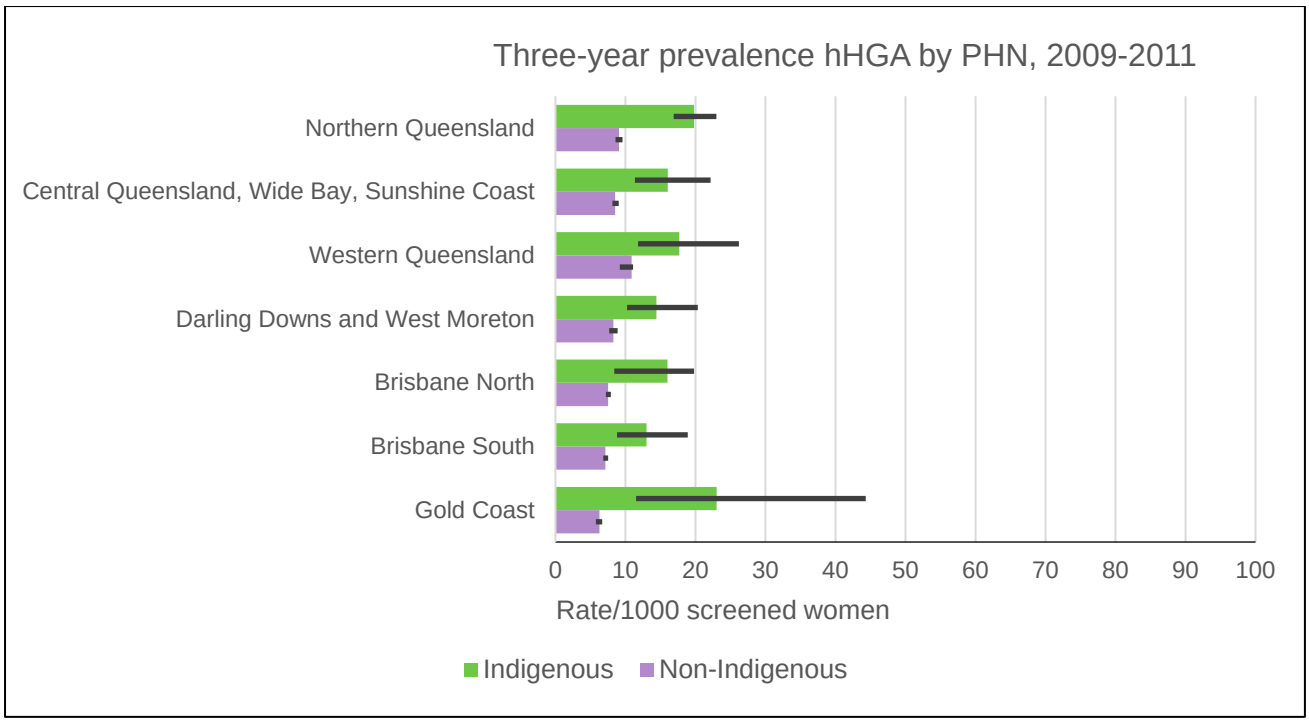
ASR Age-standardised prevalence rate, CI Confidence interval, hHGA histologically confirmed high-grade abnormality

1. Prevalence is the number of hHGA among women in each specified time-period and age group divided by the number of women screened for the same time-period and age group, stratified by Indigenous status and age-standardised to the 2001 Australian standard population (per 1000 screened women). Please see text for further details.
2. Periods covered apply to calendar years.

Five-, three- and two-year age-standardised prevalence rates of histologically confirmed high-grade abnormalities (with 95% CI) by Indigenous status are presented by PHN (Figure 11) and HHS (Figure 12) for the latest time-period, with the corresponding tabulated data shown in Appendices 6 and 7.

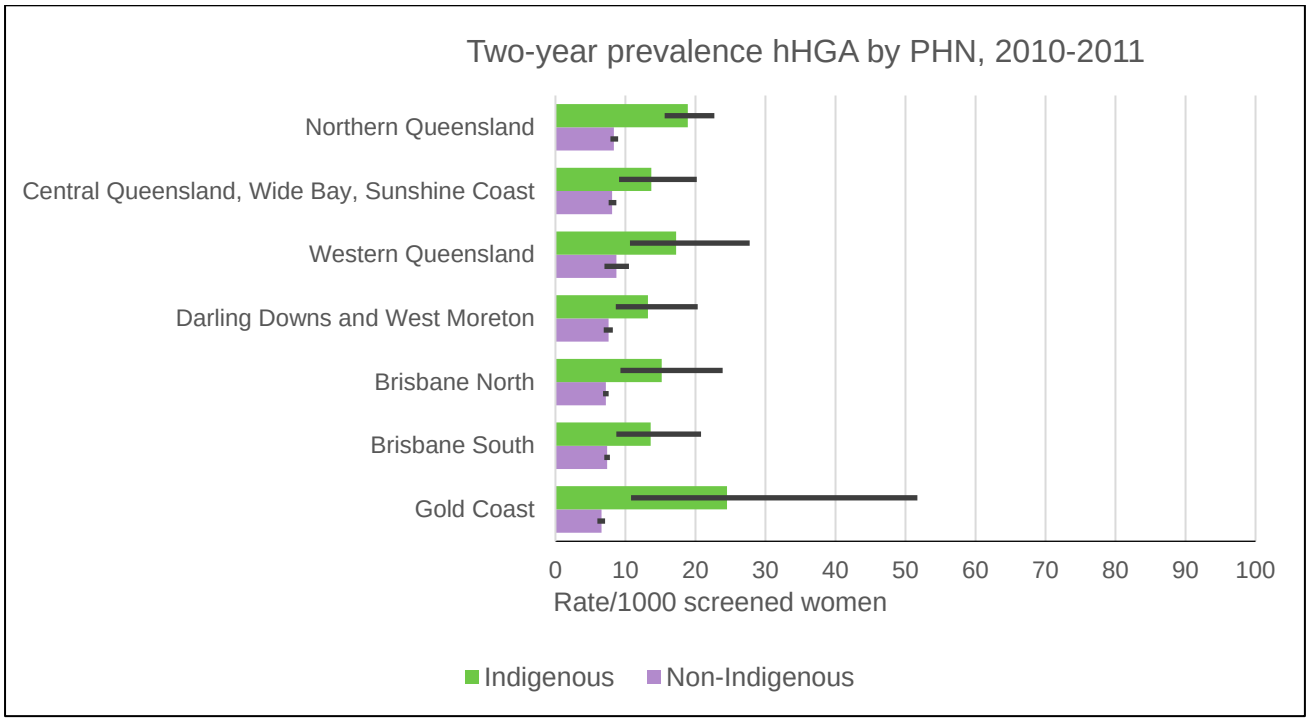
Figure 11 Age-standardised prevalence of histologically confirmed high-grade cervical abnormalities for women aged 20-69 years, by Indigenous status, Primary Health Network and time-period





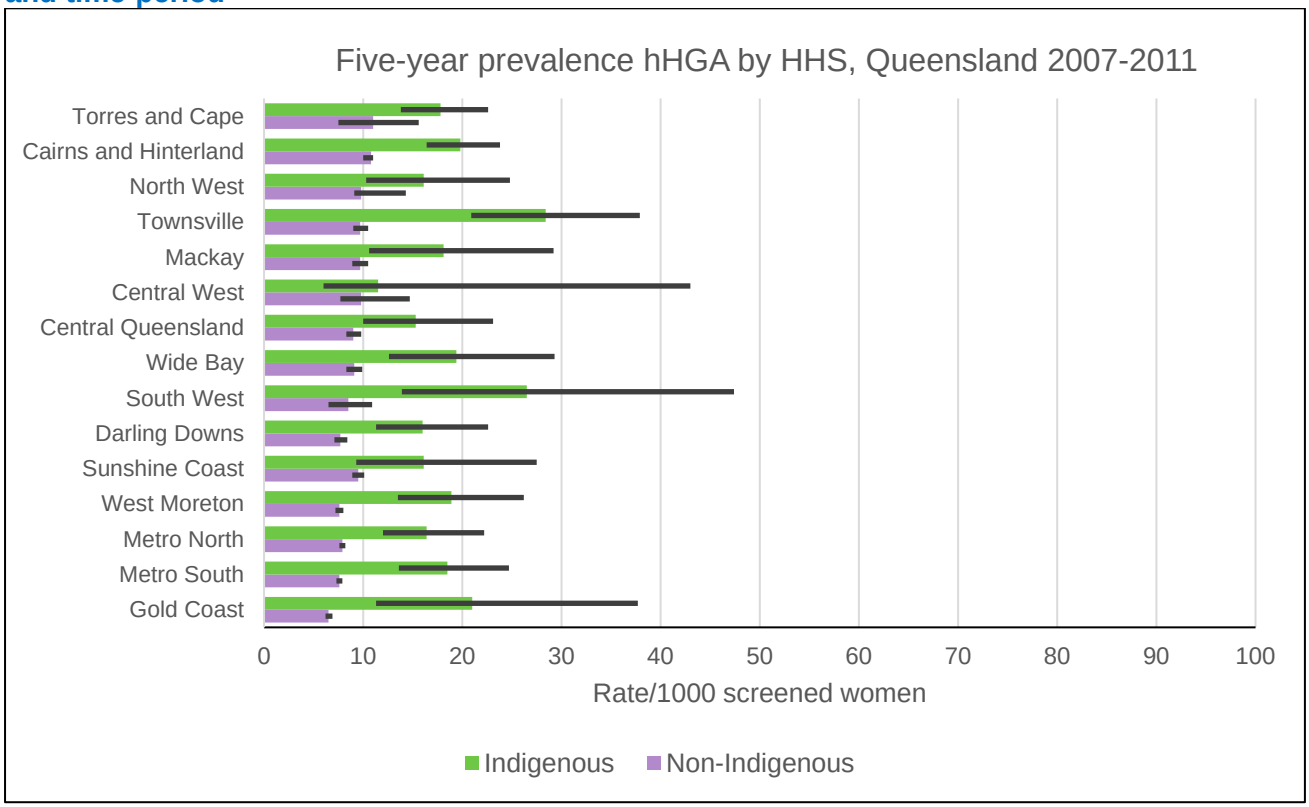
Notes:
hHGA: Histologically-confirmed high-grade abnormality.
PHN: Primary Health Network.

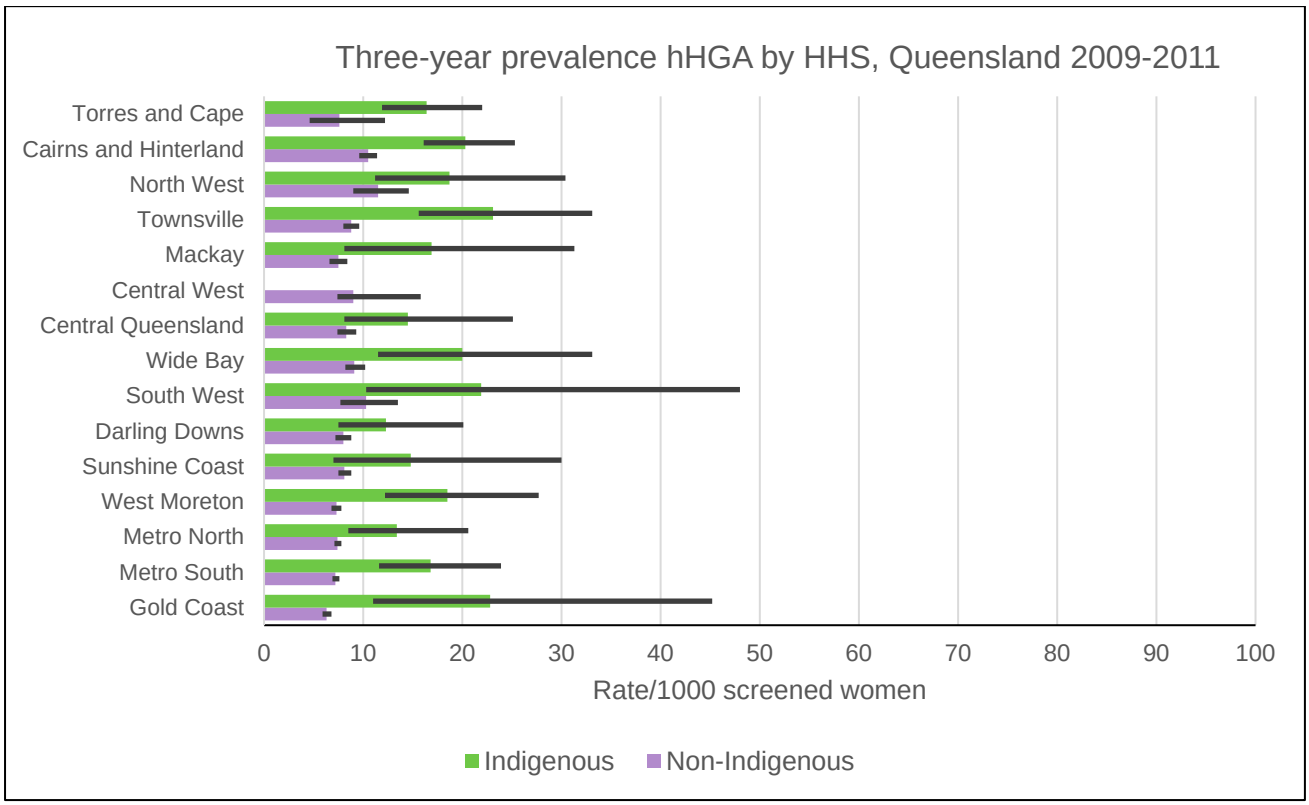
Figure 11 (continued) Age-standardised prevalence of histologically confirmed high-grade cervical abnormalities for women aged 20-69 years, by Indigenous status, Primary Health Network and time-period



Notes:
hHGA: Histologically-confirmed high-grade abnormality.
PHN: Primary Health Network.

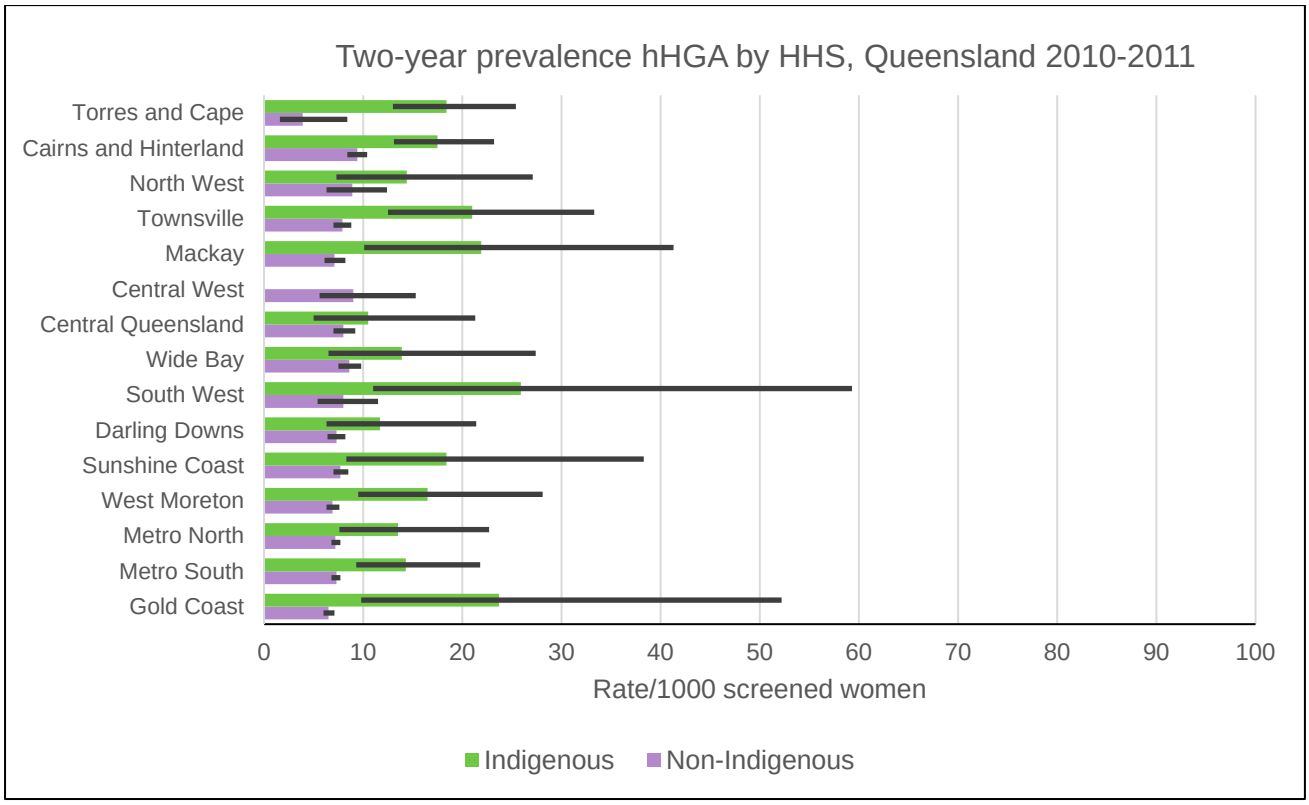
Figure 12 Age-standardised prevalence of histologically confirmed high-grade cervical abnormalities for women aged 20-69 years, by Indigenous status, Hospital Health Service and time-period





Notes:
hHGA: Histologically-confirmed high-grade abnormality
HHS: Hospital Health Service Rates where numerator is less than five have been supressed to protect confidentiality.

Figure 12 (continued) Age-standardised prevalence of histologically confirmed high-grade cervical abnormalities (hHGA) for women aged 20-69 years, by Indigenous status, Hospital Health Service and time-period



Notes:
hHGA: Histologically-confirmed high-grade abnormality
HHS: Hospital Health Service
Rates where numerator is less than five have been supressed to protect confidentiality.

These results highlighted the consistently higher prevalence of histologically confirmed high-grade abnormalities among Indigenous women than non-Indigenous women across the different PHN and HHS regions.

The differences in five-year prevalence of hHGA by Indigenous status were significant for all seven PHN regions, based on non-overlapping CI for the point estimates. (Figure 11, Table A6.1) While most of the inequalities in hHGA prevalence by HHS were also significant (Figure 12, Table A7.1), wide overlapping confidence intervals for the remaining four regions: North West, Central West, Sunshine Coast and Torres and Cape mean that those estimates should be interpreted cautiously.

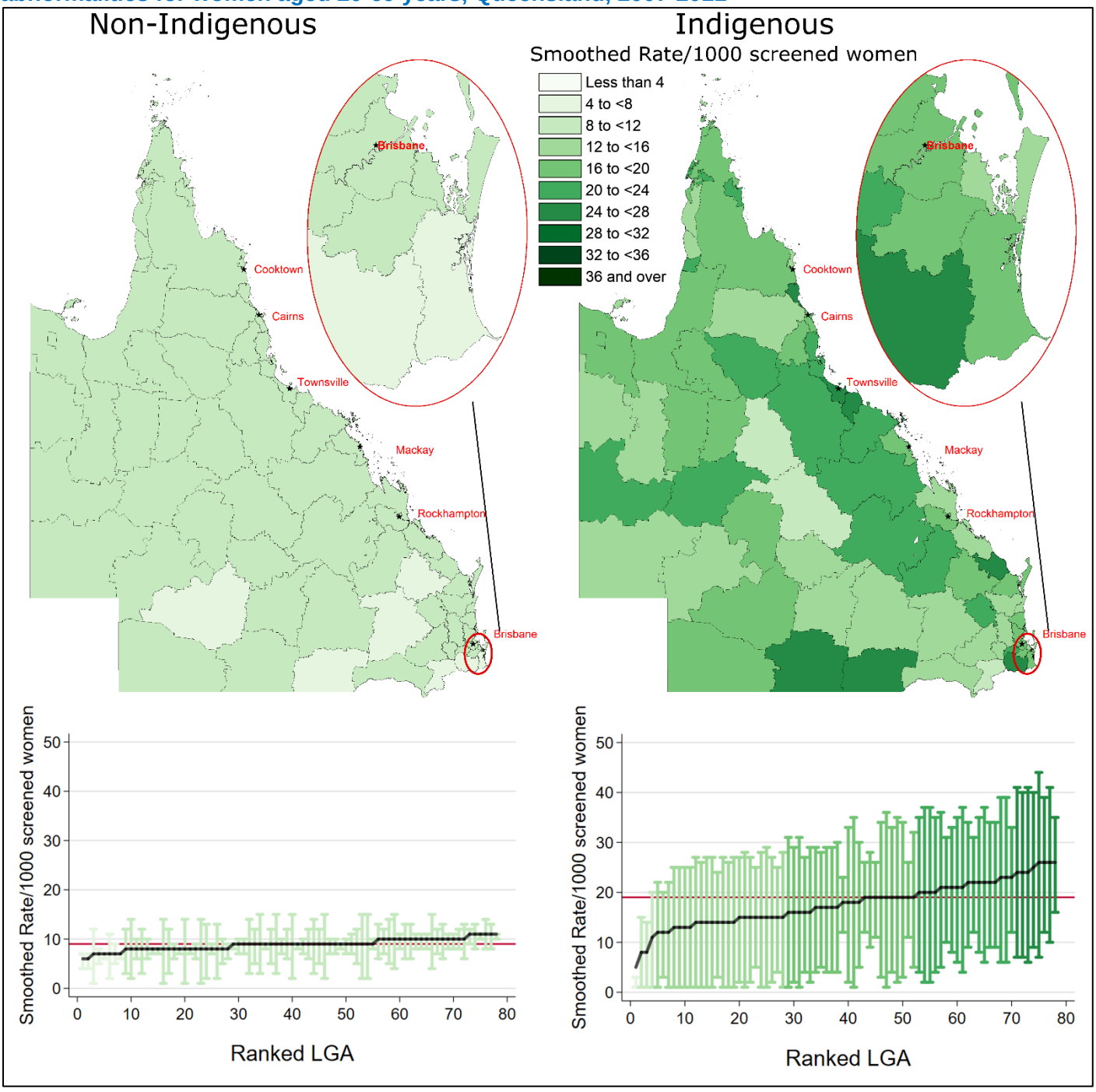
Even when considering this variation, some regions, notably Gold Coast, Townsville and South West appeared to have wider inequalities than the state average. For example, the five-year prevalence of hHGA among Indigenous women aged 20 to 69 years from the Gold Coast HHS was 21.0 (per 1000 screened women, 95% CI 11.3-37.7) compared to 6.5 (per 1000 screened women, 95% CI 6.2-6.9) for non-Indigenous women. The corresponding estimates were 28.4 (per 1000 screened women, 95% CI 20.9-37.9) and 26.5 (per 1000 screened women, 95% CI 13.9-47.4) for Indigenous women from Townville or South West HHS compared to 9-10 per 1000 screened non-Indigenous women.

Although Indigenous women from Northern Queensland region had higher participation rates than the state average, the Indigenous/non-Indigenous differential in prevalence of hHGA among screened women remained.

Given the wide confidence intervals for many of the two- and three-year prevalence estimates by both PHN and HHS, these patterns should be interpreted with some caution.

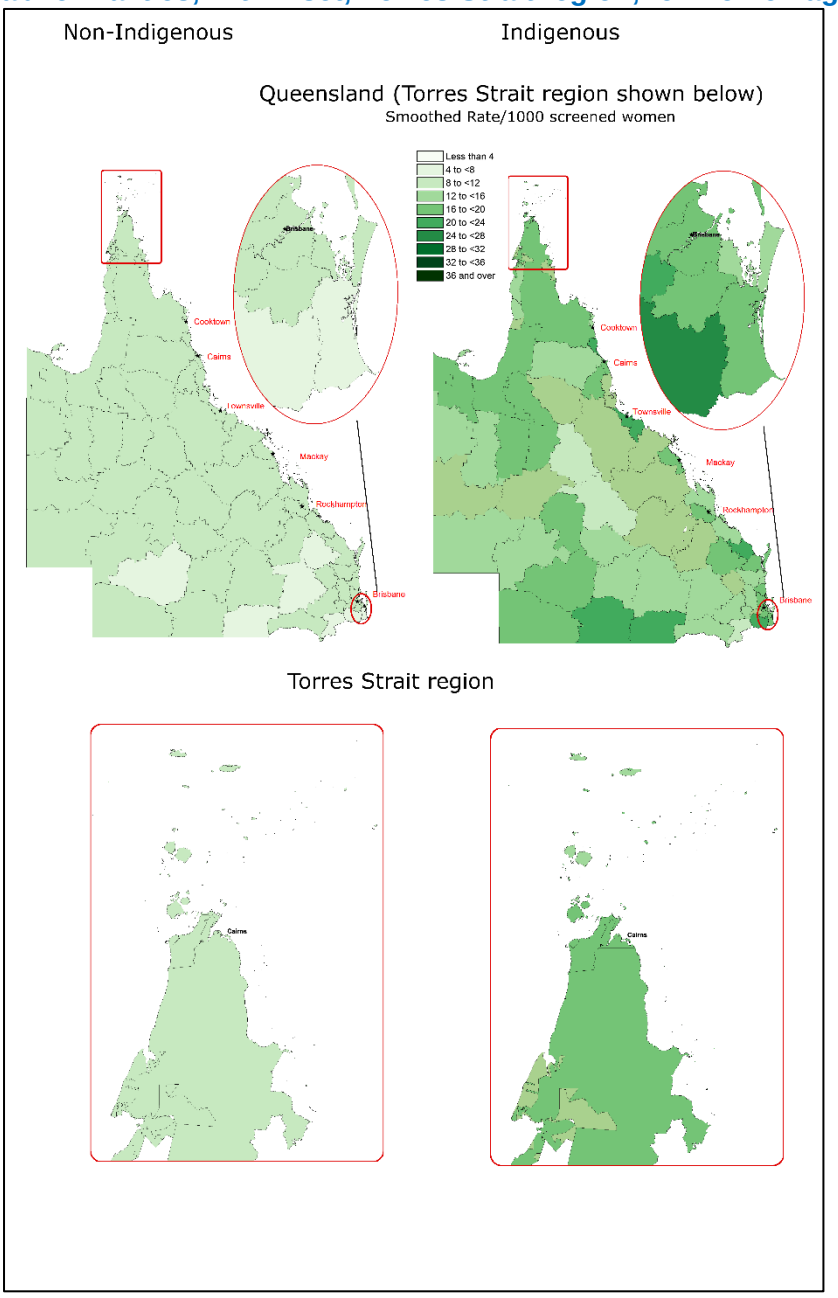
The smoothed five-year prevalence rates of histologically-confirmed high-grade abnormalities across LGA's were consistently lower and more stable (IQR 8.0-10.1 per 1000 screened women) for non-Indigenous women, while the corresponding rates among Indigenous women were higher and varied markedly (IQR 15.0-21.3 per 1000 screened women) across the state. (Figure 13) Estimates for Indigenous women also had greater uncertainty reflected in the wider confidence intervals for the ranked mapped estimates by LGA. Additional maps showing the five-year prevalence for the Torres region is included. (Figure 14) For context, the population of screened women used as the denominator in calculating hHGA prevalence rates by LGA is included. (Figure 15)

Figure 13 Locally smoothed five-year prevalence of histologically confirmed high-grade cervical abnormalities for women aged 20-69 years, Queensland, 2007-2011



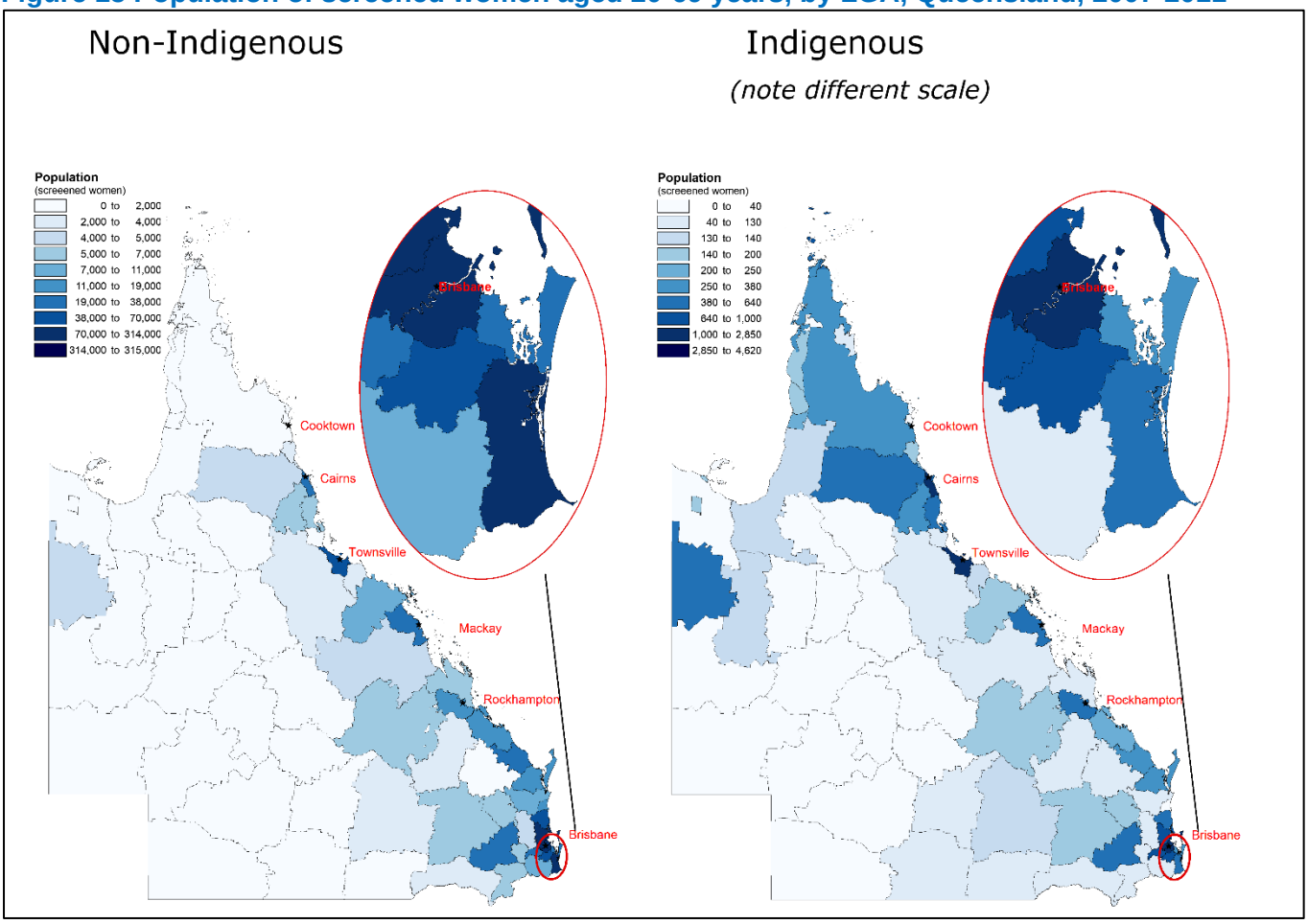
Notes:
Darker shades indicate higher prevalence of histologically-confirmed high-grade cervical abnormalities.
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 14 Locally smoothed five-year prevalence of histologically confirmed high-grade cervical abnormalities, with inset, Torres Strait region, for women aged 20-69 years, Queensland 2007-2011



Notes:
Darker shades indicate higher prevalence of histologically-confirmed high-grade cervical abnormalities.

Figure 15 Population of screened women aged 20-69 years, by LGA, Queensland, 2007-2011



Notes:
LGA: Local Government Area

3.3 Rate of clinical investigation within two months of cytological high-grade cervical abnormalities

There were 16,488 women aged 20 to 69 years with geographical information with a first cHGA detected ("index smear") between 1st January 2006 and 31st December 2009. After excluding 52 women who had a clinical investigation on the same date as their index smear, or a previous cancer diagnosis, and 33 women aged 69 years at their index smear, the final study cohort consisted of 16,403 women (n=795 Indigenous, 5%) aged 20 to 68. Of these, 4,990 (30%) had no clinical follow-up over the study period. Of the remaining 11,413 women, only 7,235 (64%) of which 4% were Indigenous (n=269) had a clinical investigation within two-months of the index smear.

The overall age-standardised rate of clinical investigation within the recommended two-month period was lower for Indigenous women (34.7 per 100 women, 95% CI 28.9-40.2) than non-Indigenous women (43.3 per 100 women, 95% CI 42.1-44.6).

The overall age-specific rates of clinical investigation within two months of a cHGA were also lower for Indigenous women than non-Indigenous women for all age-groups, although the confidence intervals were broad and in some instances overlapping. (Table 3)

Table 3 Age-standardised rate of clinical investigation by Indigenous status and broad age group, Queensland, 2006-2009

	Non-Indigenous		Indigenous	
	ASR/100	95% CI	ASR/100	95% CI
Rate of clinical investigation, 2, 6, and 12 months after cHGA, (aged 20-68 years)[1,2,3,4]				
Two months	43.3	[42.1, 44.6]	34.7	[28.9, 40.2]
Six months	60.3	[58.8, 61.8]	58.9	[51.6, 67.1]
Twelve months	63.8	[62.3, 65.2]	69.1	[64.7, 74.8]
Rate of clinical investigation two months after cHGA by age group)[1,2,3,4]				
20-39	45.9	[44.6, 47.2]	34.3	[29.5, 39.6]
40-59	42.3	[40.1, 44.6]	39.8	[28.4, 54.3]
60-68	36.4	[31.4, 42.0]	17.9	[4.9, 49.3]
20-68 combined	43.3	[42.1, 44.6]	34.7	[28.9, 40.2]

ASR Age-standardised rate (per 100 women), CI Confidence interval, cHGA cytological high-grade abnormalities

1. Rate is the number of clinical investigation within given follow-up period after a cHGA index smear (2006-2009) among women in each specific age group divided by the number of women with cHGA Pap smear result from 2006 to 2009 for the same age group, stratified by Indigenous status and age-standardised to the 2001 Australian standard population (per 100 women). Please see text for further details
2. Women followed-up for clinical investigation until 31 December 2010
3. Clinical investigation includes histological test or cervical cancer diagnosis
4. Periods covered apply to calendar years.

Age-standardised rate of clinical investigation (with 95% CI) within two months of a cHGA are presented by Indigenous status and PHN (Figure 16) or HHS (Figure 17) for women screened in 2006-2009. The corresponding tabulated data are shown in Appendix 8. While these showed that the rate of clinical investigation within two months of the index smear was consistently higher among non-Indigenous women than Indigenous women, the extent of this inequality varied substantially across the PHN and HHS areas. For

example, the differential in some HHS areas, such as Torres and Cape (31 versus 30 for non-Indigenous and Indigenous respectively) and Metro South (48 versus 46) was very small, while for others such as Central West (38 versus 7) and Mackay (55 versus 30) the differential was much larger. However, the wide confidence intervals for all the point estimates by PHN and HHS for both groups of women (Figure 16, Figure 17, Table A8.1, Table A8.2) mean that these results need to be interpreted with caution.

Due to small numbers, we needed to use global smoothing against the Queensland average, rather than local smoothing for the LGA-specific estimates of rates of clinical investigation within two months of cHGA for Indigenous women. These maps (Figure 18, Figure 19) indicated that a higher proportion of non-Indigenous women were followed up within two months of an abnormal screening result. However, the very wide confidence intervals for the mapped estimates, reflecting the typically low LGA-specific populations of women with cytological high-grade abnormalities, (the denominator, Figure 20) limits our ability to draw definitive conclusions about the geographical patterns for this outcome. Additional details about these estimates for the Torres-Strait region is also provided.

Figure 16 Age-standardised rate of clinical investigation within two months of cytological high-grade abnormalities for women aged 20-68 years, by Indigenous status and Primary Health Network, 2006-2009

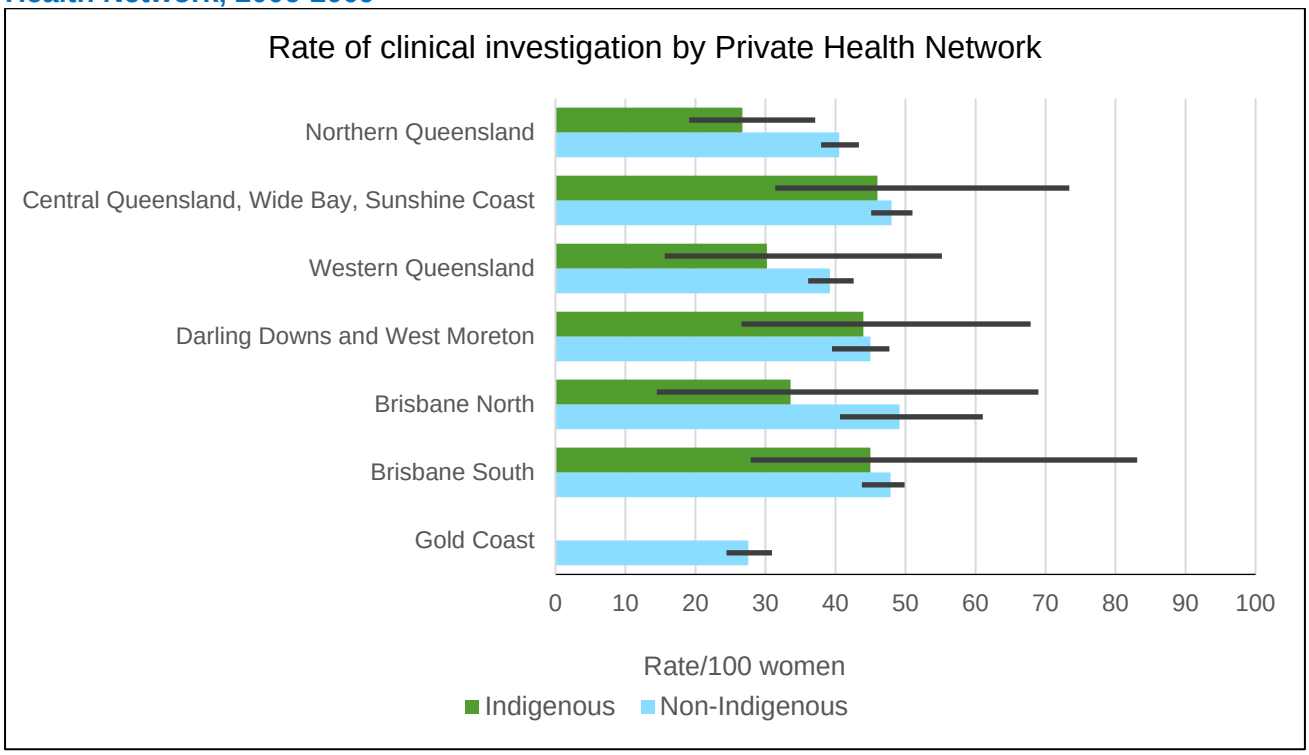
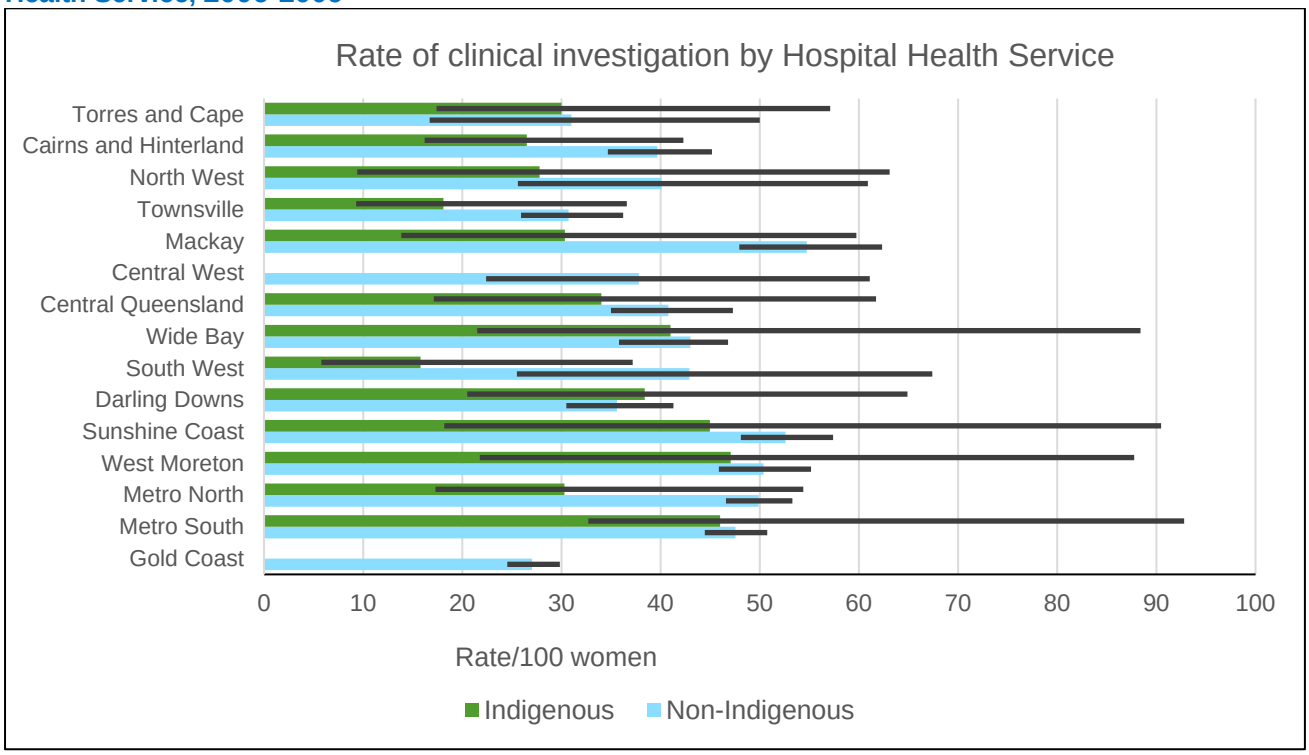
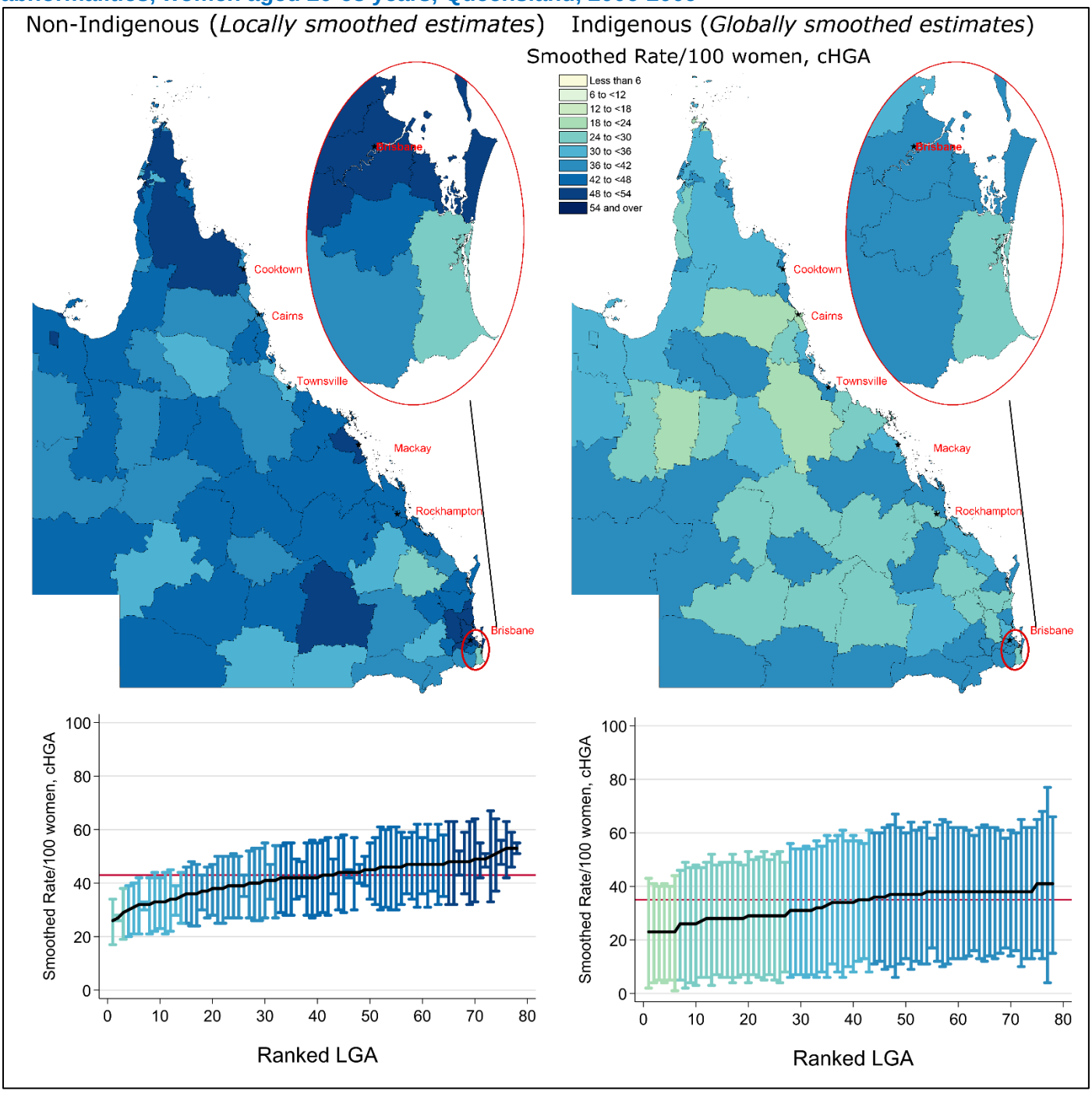


Figure 17 Age-standardised rate of clinical investigation within two months of cytological high-grade abnormalities for women aged 20-68 years, by Indigenous status and Hospital Health Service, 2006-2009



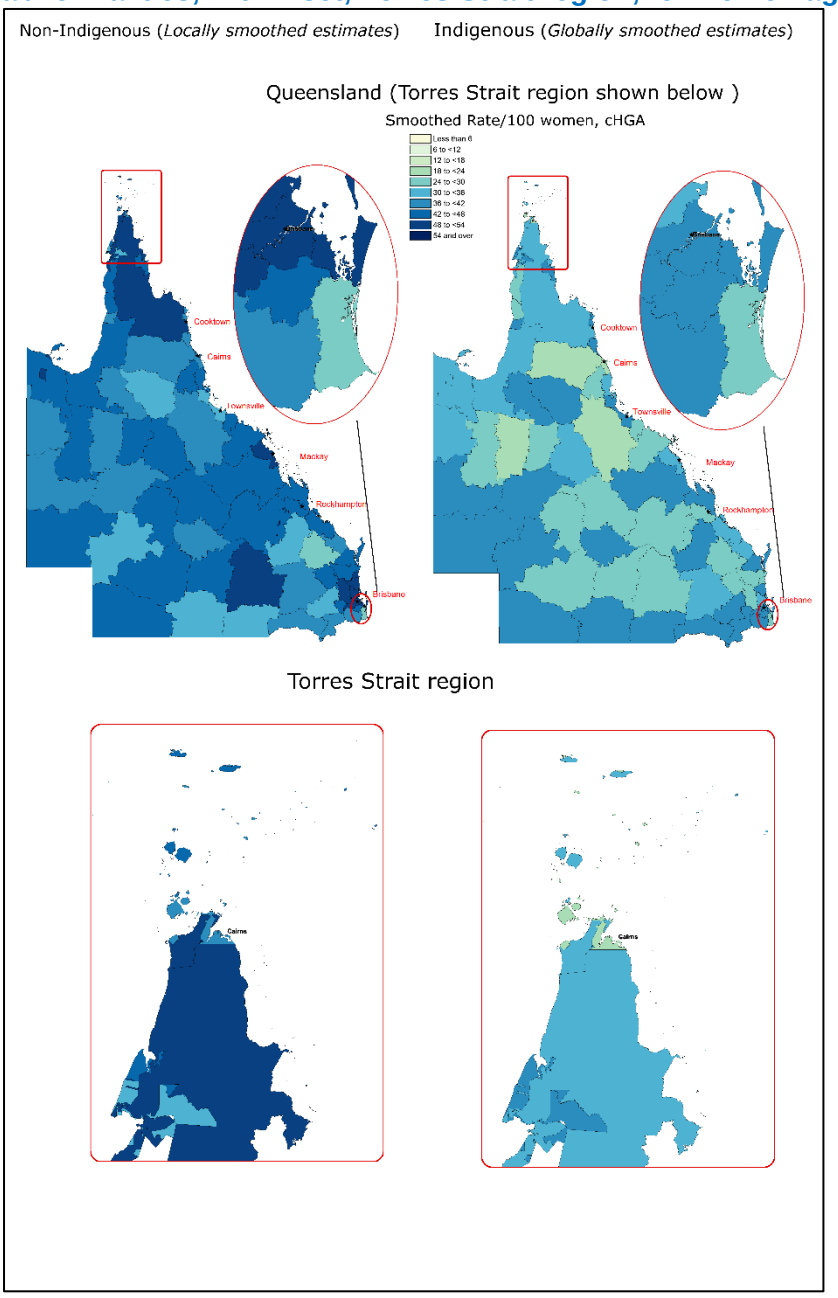
Notes:
Clinical investigation includes histological test or cervical cancer diagnosis
Rates where numerator is less than five have been supressed to protect confidentiality.

Figure 18 Smoothed rate of clinical investigation within two months of cytological high-grade abnormalities, women aged 20-68 years, Queensland, 2006-2009



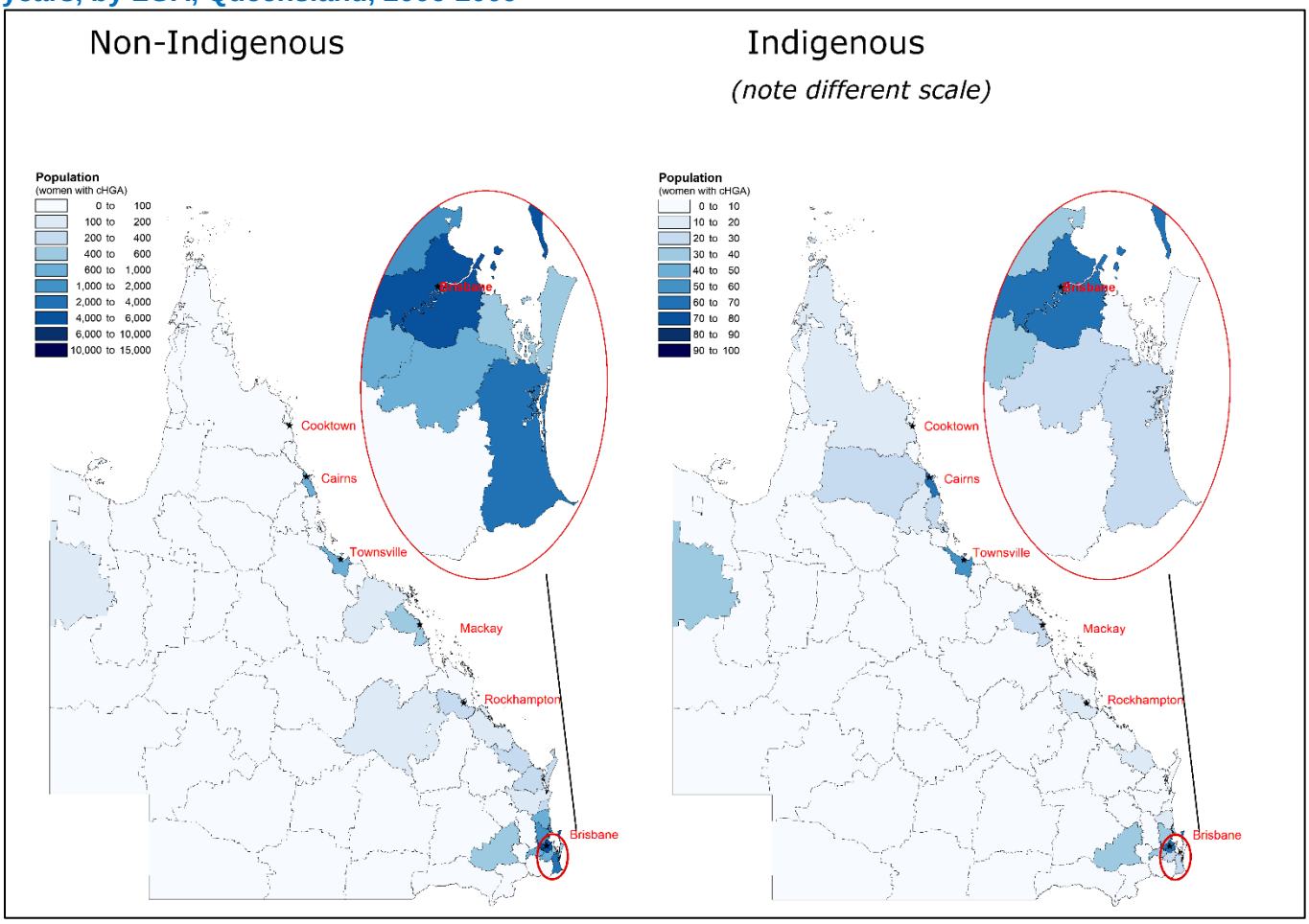
Notes:
Rates for non-Indigenous women are the locally smoothed estimates. Corresponding rates for Indigenous women are the globally smoothed estimates.
Darker shades indicate higher rates of clinical investigation (histology or cervical cancer diagnosis) within two-months of a cytological high-grade cervical abnormality (cHGA).
Graphs show ranked 95% confidence intervals for each Local Government Area (LGA) coloured as per the smoothed estimates in the maps. The black line is the mapped estimate. Red line is the estimate for total Queensland.

Figure 19 Smoothed rate of clinical investigation within two months of cytological high-grade abnormalities, with inset, Torres Strait region, for women aged 20-68 years, Queensland, 2006-2009



Notes:
Rates for non-Indigenous women are the locally smoothed estimates. Corresponding rates for Indigenous women are the globally smoothed estimates.
Darker shades indicate higher rates of clinical investigation (histology or cervical cancer diagnosis) within two-months of a cytological high-grade cervical abnormality (cHGA).

Figure 20 Population of women detected with cytological high-grade abnormalities, aged 20-68 years, by LGA, Queensland, 2006-2009



Notes:
cHGA: cytological high-grade abnormality
LGA: Local Government Area

Discussion

This report examined regional variation in cervical cancer screening participation among Indigenous and non-Indigenous women living in Queensland between 2006 and 2011, along with outcome measures for those who participated in that cervical screening. The primary focus was how the extent of the Indigenous/non-Indigenous differential for each outcome varied across geographical areas.

4.1 Summary

This report found high levels of geographical variation in cervical screening participation rates and prevalence of histologically-confirmed high-grade abnormalities across LGAs and larger geographical areas in Queensland from 2006 to 2011. Our findings were also suggestive of geographical variation in the rates of follow-up of abnormal Pap smear results within the two-months recommended guideline. This variation was especially marked among Indigenous women, hence the magnitude of the Indigenous and non-Indigenous differential also varied substantially across Queensland. However, a consistent pattern of poorer participation and related outcomes for Indigenous women was evident across all geographical areas in Queensland. This direction of effect was consistent with that previously reported for total Queensland, (8-10) and an earlier Queensland study reporting lower participation rates among Indigenous women from 13 rural and remote communities. (5)

There was some evidence, that Indigenous women in the South-East corner of the state had consistently lower participation rates than the state average, while corresponding rates were higher than average in Far North Queensland. Reasons for this are unclear. The accuracy of Indigenous identification generally improves with increasing remoteness, (25) hence participation rates in major cities are more likely to be underestimated. Another possibility is that women living close to the southern Queensland border, who were included in the Queensland PSR may have attended a hospital interstate and thus be less likely to be identified as Indigenous through the record linkage methodology.

Increasing participation in cervical screening for Indigenous women may allow earlier detection and consequent treatment of high-grade cervical abnormalities. Indigenous women are also more likely to live in socio-economically disadvantaged areas, have higher smoking rates, lower age at first full term pregnancy and higher fertility rates (26), all of which are risk factors for high-grade cervical abnormalities. (27) In addition, although we had no information on age-specific prevalence and distribution of human papillomavirus (HPV) genotypes among women in our cohort, the consistently higher prevalence of cervical abnormalities among Indigenous women, suggested that differences in HPV infection patterns by Indigenous status may exist. Hence ensuring high HPV vaccination rates among Indigenous communities and ongoing monitoring of its impact on HPV-related conditions remains crucial. (28, 29)

Additional logistic and cultural barriers, including perceptions and knowledge about cancer screening, the social determinants of health including lower educational levels, poverty, cultural marginalisation, racism and a lack of culturally appropriate care are also likely to impact on Indigenous/non-Indigenous differential in screening participation and outcomes. (30, 31)

Opportunities to increase screening participation among Indigenous women and the design of targeted interventions to increase the number of women who are followed up within recommended time-periods across all geographical areas, thereby increasing the earlier detection of high-grade cervical abnormalities remain a priority.

In December 2017, the current NCSP was replaced by a new program (termed the “Renewal”), with primary HPV testing every five years for women aged 25-74 years. (32) The Renewal is based on current evidence supporting no impact of NCSP for women aged under 25 years (2) and improved technology. (33) While the data described in this report relates to 2006 to 2011, these results are still relevant for the Renewal, especially among Indigenous women. The National Cancer Screening Register, which will support the Renewal, aims to collect Indigenous status (34), through Medicare, supplemented by self-notification via a website.

It is likely that the key factors influencing participation in the Renewal mainstream program, which still requires the collection of a cervical sample by a clinician for HPV-testing, will be similar to those that impacted participation in Pap test based cervical screening. To this end, we have reported five-year participations rates for consistency with the planned five-year interval of the Renewal. While there are new aspects of the Renewal that will hopefully improve participation, (32, 33), including self-sampling, (35) the effectiveness of these strategies has not been specifically assessed for Indigenous women. Regardless of which method is used, providing Indigenous women with access to culturally appropriate and focused services and support to complete the screening pathway remains critical. Hence the potential of the Renewal to reduce inequity in screening participation and outcomes can only be achieved, with the development of effective and targeted interventions. Otherwise, it is likely that the geographical variations observed in previous years will continue.

4.2 Limitations

Results are based on the self-reported residential address when screened, which may be a postal address (post box) rather than actual street address. Since this information was limited to suburb and postcode only, it was not possible to further adjust postal addresses. An LGA often includes multiple suburb-postcode combinations, and their boundaries may not necessarily match with the LGA boundaries.

We used a ABS-derived population-weighted correspondence to map postcodes and suburb to Queensland LGAs, (13) which were then combined into the PHN and HHS areas using the relevant digital boundaries and correspondence files. (16, 17) While conversions using population-weighted correspondences reduce the inaccuracies from these area-based correspondences, (36) they are based on entire populations, and so may not represent the distribution of women aged 20-69 years nor by Indigenous status.

The published estimates of the Indigenous populations by LGA are not exact, and are likely to contain errors due to the assumptions made in the estimation process. (18, 37, 38) Moreover, population estimates for women aged 65 to 69 years were estimated assuming that the proportion of women in this age group by Indigenous status was the same across all LGAs in Queensland. Any impact of this is restricted to the estimated participation rates, where these population data are the denominator and will be greater for the often small LGA-specific populations.

Indigenous status for cervical screening data was identified by probabilistic record linkage utilizing existing public health data collections and as such it is inevitable that some women in the PSR would not have been correctly identified as Indigenous due to misclassification during notification, errors in the data linkage process

or no public hospital record during the study period. However, the recording of self-identified Indigenous status in both hospital (25) and cancer registry (39) databases in Queensland are considered to be sufficiently reliable for analytical purposes.

The lack of data on hysterectomy fractions by Indigenous status and/or small geographical areas compromised our ability to accurately determine the eligible population for cervical cancer screening. Indigenous women may have a lower rate of hysterectomies than non-Indigenous women, (5, 20) however the impact of this on estimated participation rate for Indigenous women has been previously reported to be minimal. (5, 8)

The reported confidence intervals around the mapped estimates are based solely on the observed uncertainty and do not consider the above further sources of potential error and greater uncertainty.

Smoothed estimates were presented in maps. Maps provide a rapid visual picture of large amounts of information, and geographical gradients in a mapped outcome. However, they also have the potential to be visually misleading especially when the mapped areas vary in size and the larger regions that may dominate the image are also the most sparsely populated and/or have smaller counts and so have the greatest uncertainty. Our selection of map elements such as colours and scales were chosen to minimise these issues.

4.3 Strengths

This study is the first to look at regional variation in cervical screening participation rates and related outcome measures in Queensland by Indigenous status. It is hoped that this report will be a valuable resource for those administering cervical screening programs, to identify areas of disparity and direct services accordingly.

Conclusions

In conclusion, we found a high level of regional variation in cervical screening participation rates and the prevalence of high-grade abnormalities in Queensland between 2006 and 2011, with some suggestion of variation in the rate of clinical investigation within recommended two-month follow-up period. This variation was particularly pronounced among Indigenous women, meaning that the inequality in outcomes between Indigenous and non-Indigenous women also varied greatly across Queensland. However, while the magnitude varied, there was a consistent pattern of poorer participation and related outcomes for Indigenous women across the state. Overall, there appear to be many small geographical areas where there are opportunities to improve cervical cancer participation and related outcomes for Indigenous women.

It is hoped that the results of this report will not only provide greater awareness of how these measures vary by geographical area across Queensland, but provide motivation to investigate the reasons why these patterns exist. Further research is required to investigate the role and impact of local, environmental, cultural, clinical and health-care system related barriers that may potentially have contributed to the observed regional variations identified in this report. In addition, ecological analyses designed to identify how area level and health services related characteristics influence the observed variation in measures may provide important insights into the key drivers of this variation. Finally, our findings also highlight the need for ongoing monitoring of spatial variation in cervical screening related measures.

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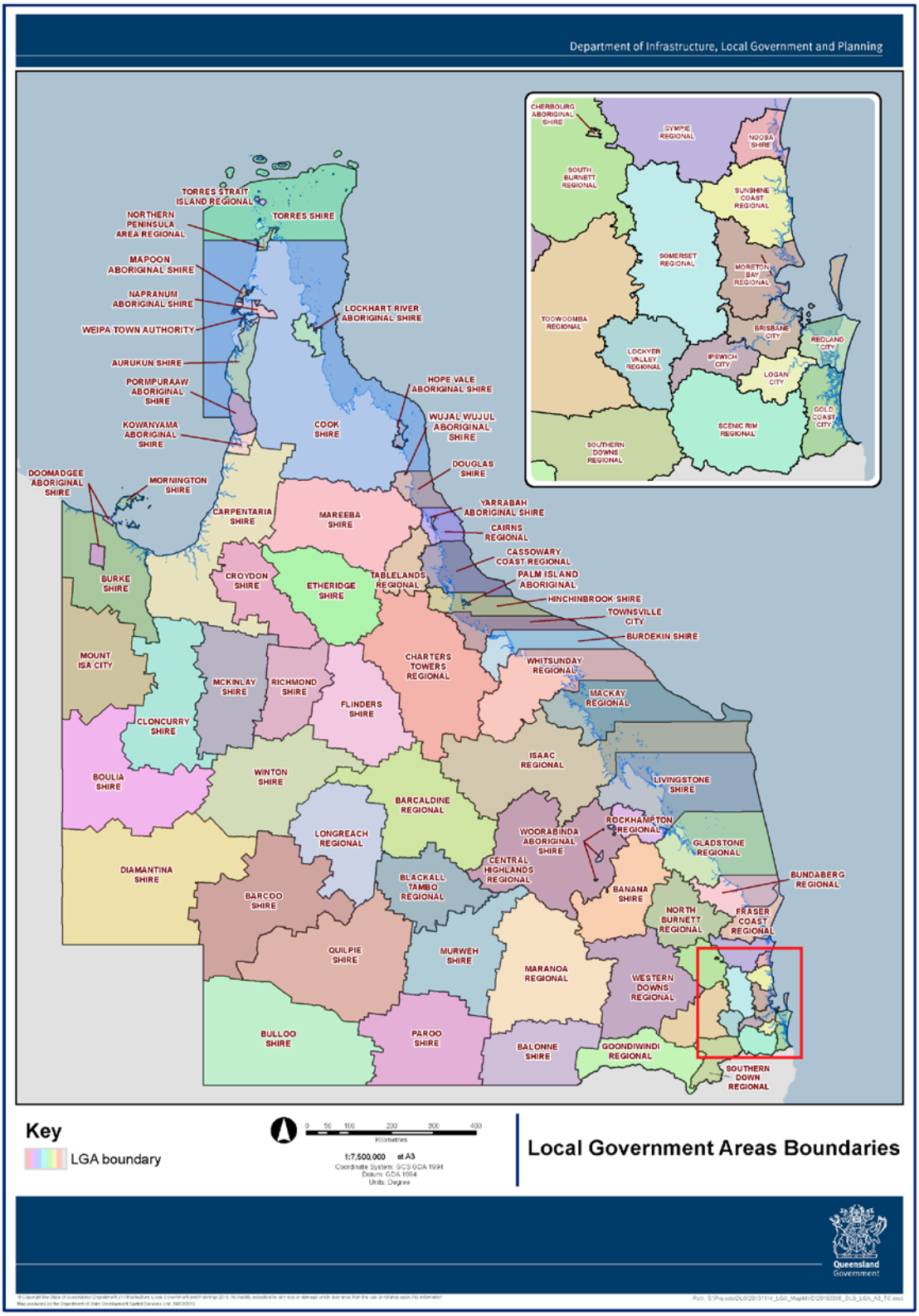
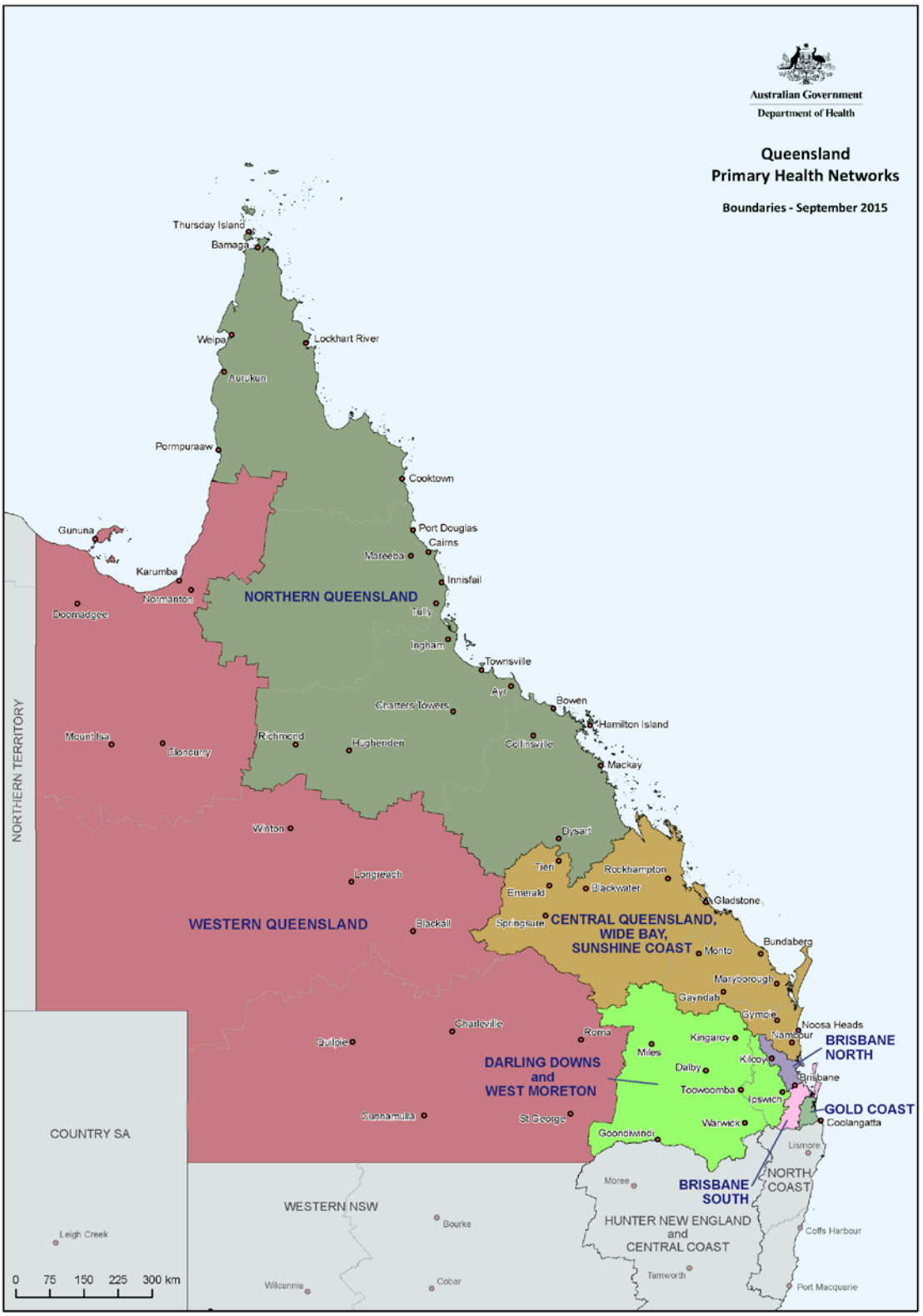
Appendix 1 Additional maps

Figure A1.1 Local Government area boundaries, Queensland, 2015



Source: http://www.statedevelopment.qld.gov.au/resources/map/local-government-area-boundaries.pdf

Figure A1.2 Primary Health Network (PHN) boundaries, Queensland, 2015

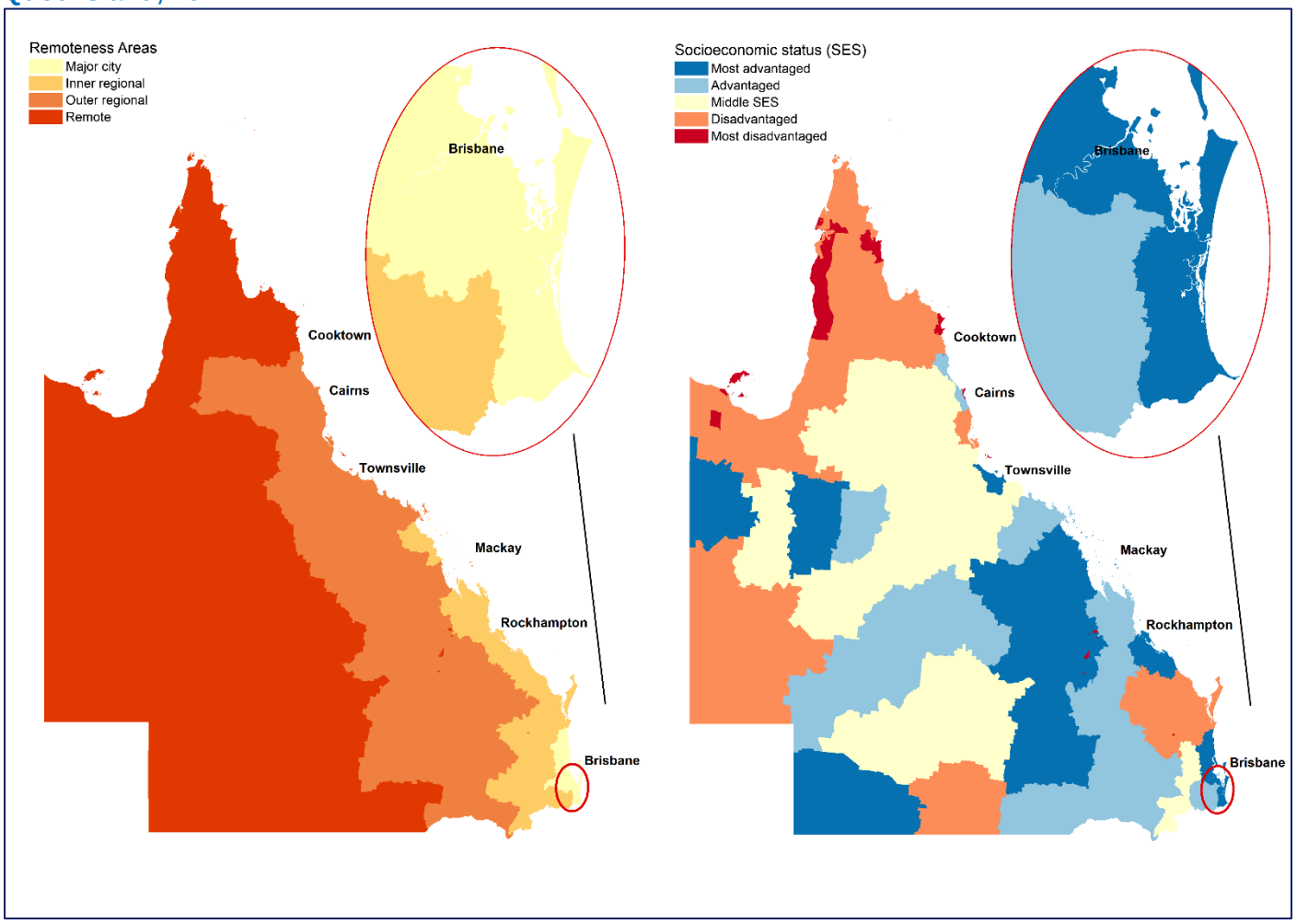


Source: http://www.health.gov.au/internet/main/publishing.nsf/content/2B985F0A318B2F61CA257F150001FD49/$File/phnQldSep15.pdf

Figure A1.3 Hospital and Health Service (HHS) regions boundaries, Queensland, 2015

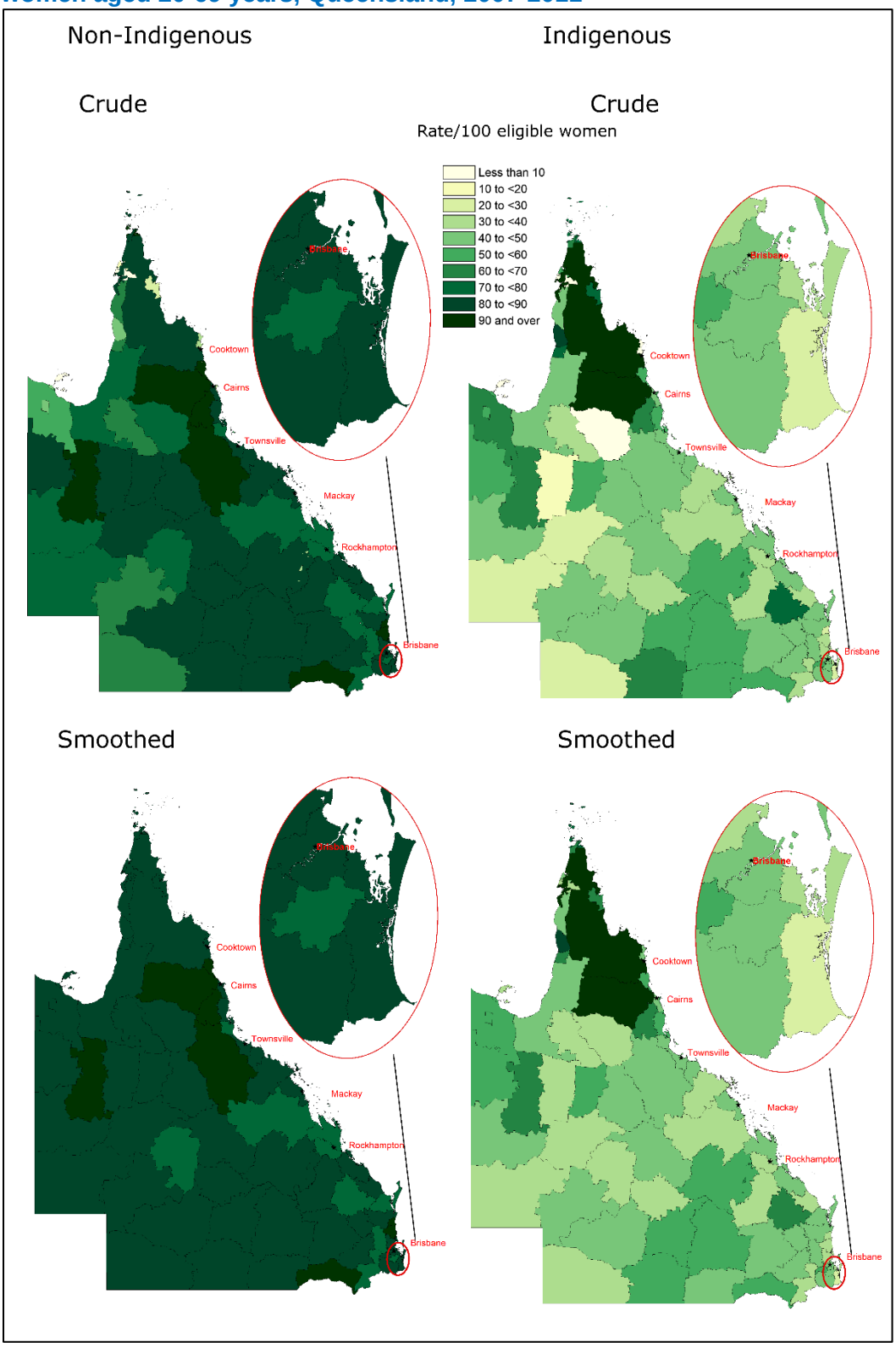
Source: https://www.health.qld.gov.au/maps

Figure A1.4 Remoteness and socioeconomic status by Local Government Areas (LGA), Queensland, 2011



Appendix 2 Impact of smoothing on estimates

Figure A2.1 Impact of smoothing on five-year Pap smear participation rates by Indigenous status, women aged 20-69 years, Queensland, 2007-2011



Note:
Eligible women are women aged 20 to 69 years who did not have a hysterectomy.

Appendix 3 Pap smear participation rates by Indigenous status and PHN, Queensland, 2006-2011

Table A3.1 Five-year age-standardised Pap smear participation rates for women aged 20 to 69 years, by PHN

PHN Name	Time-period	Non-Indigenous			Indigenous		
		ERP	ASR/100	[95% CI]	ERP	ASR/100	[95% CI]
Northern Queensland	2007-2011	162,056	86.6	[86.2, 87.1]	16,842	54.5	[53.3, 55.7]
Central Queensland, Wide Bay, Sunshine Coast	2007-2011	201,641	86.0	[85.6, 86.4]	5,835	41.5	[39.8, 43.3]
Western Queensland	2007-2011	15,470	83.6	[82.1, 85.0]	3,257	50.0	[47.5, 52.6]
Darling Downs and West Moreton	2007-2011	128,947	79.4	[78.9, 79.9]	4,663	47.3	[45.2, 49.5]
Brisbane North	2007-2011	246,797	84.0	[83.7, 84.4]	4,208	39.8	[37.1, 41.3]
Brisbane South	2007-2011	290,144	83.7	[83.4, 84.0]	5,281	41.5	[39.6, 43.4]
Gold Coast	2007-2011	147,554	85.7	[85.2, 86.1]	1,771	24.5	[22.1, 27.2]

ASR Age-standardised participation rate, CI Confidence interval, ERP Estimated resident population over given time period; PHN Primary Health Network

Table A3.2 Three-year age-standardised Pap smear participation rates for women aged 20 to 69 years, by time-period and PHN

PHN Name	Time-period	Non-Indigenous			Indigenous		
		ERP	ASR/100	[95% CI]	ERP	ASR/100	[95% CI]
Northern Queensland	2006-2008	154,901	74.3	[73.9, 74.7]	15,898	45.6	[44.4, 46.7]
	2009-2011	165,552	72.8	[72.4, 73.2]	17,343	44.5	[43.5, 45.6]
Central Queensland, Wide Bay, Sunshine Coast	2006-2008	193,134	73.9	[73.5, 74.3]	5,488	34.9	[33.2, 36.6]
	2009-2011	205,714	71.1	[70.7, 71.4]	6,013	32.6	[31.1, 34.2]
Western Queensland	2006-2008	15,138	70.3	[69.0, 71.7]	3,218	36.7	[34.6, 39.0]
	2009-2011	15,644	69.9	[68.6, 71.2]	3,274	39.7	[37.5, 42.0]
Darling Downs and West Moreton	2006-2008	122,748	68.5	[68.0, 68.9]	4,287	40.1	[37.9, 42.3]
	2009-2011	132,126	65.3	[64.9, 65.8]	4,868	37.3	[35.4, 39.2]
Brisbane North	2006-2008	234,030	72.4	[72.0, 72.7]	3,956	33.5	[31.5, 35.7]
	2009-2011	253,140	69.6	[69.3, 70.0]	4,334	31.9	[30.0, 33.8]
Brisbane South	2006-2008	278,124	71.8	[71.5, 72.1]	5,058	36.2	[34.4, 38.2]
	2009-2011	296,173	69.2	[68.9, 69.5]	5,393	32.3	[30.7, 34.1]

Gold Coast	2006-2008	139,100	71.7	[71.2, 72.1]	1,637	20.5	[18.1, 23.2]
	2009-2011	151,533	70.3	[69.9, 70.7]	1,840	19.1	[17.0, 21.4]

ASR Age-standardised participation rate, CI Confidence interval, ERP Estimated resident population over given time period; PHN Primary Health Network

Table A3.3 Two-year age-standardised Pap smear participation rates for women aged 20 to 69 years by time-period and PHN

PHN Name	Time-period	Non-Indigenous			Indigenous		
		ERP	ASR/100	[95% CI]	ERP	ASR/100	[95% CI]
Northern Queensland	2006-2007	152,878	61.0	[60.6, 61.4]	15,685	36.4	[35.4, 37.4]
	2008-2009	160,941	61.4	[61.0, 61.8]	16,565	35.6	[34.6, 36.6]
	2010-2011	166,862	59.1	[58.7, 59.4]	17,612	35.7	[34.8, 36.7]
Central Queensland, Wide Bay, Sunshine Coast	2006-2007	190,599	60.4	[60.0, 60.7]	5,402	27.7	[26.2, 29.3]
	2008-2009	200,658	60.7	[60.3, 61.0]	5,750	27.5	[26.1, 29.0]
	2010-2011	207,015	56.9	[56.6, 57.2]	6,099	25.5	[24.1, 26.8]
Western Queensland	2006-2007	15,044	57.2	[56.0, 58.5]	3,214	28.2	[26.3, 30.2]
	2008-2009	15,396	57.9	[56.7, 59.1]	3,229	29.8	[27.8, 31.8]
	2010-2011	15,735	55.4	[54.2, 56.6]	3,299	30.4	[28.5, 32.4]
Darling Downs and West Moreton	2006-2007	121,255	56.4	[56.0, 56.9]	4,214	31.1	[29.2, 33.1]
	2008-2009	127,651	55.2	[54.8, 55.6]	4,531	31.7	[29.9, 33.6]
	2010-2011	133,401	52.5	[52.1, 52.9]	4,982	28.5	[26.9, 30.2]
Brisbane North	2006-2007	230,729	60.3	[60.0, 60.6]	3,896	27.5	[25.6, 29.5]
	2008-2009	244,178	59.0	[58.7, 59.3]	4,130	26.6	[24.9, 28.5]
	2010-2011	255,849	56.4	[56.1, 56.7]	4,404	25.0	[23.3, 26.7]
Brisbane South	2006-2007	275,057	59.4	[59.1, 59.7]	5,005	29.9	[28.2, 31.7]
	2008-2009	287,672	58.8	[58.5, 59.0]	5,218	26.5	[24.9, 28.1]
	2010-2011	298,716	56.2	[55.9, 56.4]	5,455	26.3	[24.8, 27.8]
Gold Coast	2006-2007	136,736	58.1	[57.7, 58.5]	1,605	16.7	[14.5, 19.1]
	2008-2009	146,049	58.7	[58.3, 59.1]	1,731	16.6	[14.5, 18.9]
	2010-2011	153,163	56.4	[56.0, 56.8]	1,876	15.1	[13.2, 17.2]

ASR Age-standardised participation rate, CI Confidence interval; ERP Estimated resident population over given time period; PHN Primary Health Network

Notes:

1. Pap smear participation data by PHN calculated as an aggregate of LGAs. Please refer to text for further details.
2. Participation rate (expressed as a percentage) is the number of women aged 20-69 screened at least once in each specified time-period and PHN divided by the averaged estimated eligible resident female population (ERP) for the same age group, time-period and PHN, age-standardised to the 2001 Australian standard population.

Women who have had a hysterectomy are excluded from the eligible population. Please see text for further details.

3. Periods covered apply to calendar years.

Appendix 4 Pap smear participation rates by Indigenous status and HHS, Queensland, 2006-2011

Table A4.1 Five-year age-standardised Pap smear participation rates for women aged 20 to 69 years by HHS

HHS Name	Time-period	Non-Indigenous			Indigenous		
		ERP	ASR/100	[95% CI]	ERP	ASR/100	[95% CI]
Torres and Cape	2007-2011	2,111	96.1	[91.7, 100.6]	4,154	68.5	[65.9, 71.2]
Cairns and Hinterland	2007-2011	59,116	90.6	[89.9, 91.4]	6,691	56.1	[54.2, 58.0]
North West	2007-2011	6,165	84.3	[81.9, 86.7]	2,150	49.2	[46.2, 52.5]
Townsville	2007-2011	57,321	83.5	[82.8, 84.3]	4,183	42.0	[39.9, 44.2]
Mackay	2007-2011	43,506	84.6	[83.7, 85.4]	1,815	44.8	[41.5, 48.3]
Central West	2007-2011	3,140	80.9	[77.8, 84.1]	263	46.8	[38.5, 56.6]
Central Queensland	2007-2011	48,915	80.7	[79.9, 81.5]	2,576	43.1	[40.4, 45.9]
Wide Bay	2007-2011	55,824	81.4	[80.6, 82.2]	1,835	42.1	[39.1, 45.3]
South West	2007-2011	6,167	83.7	[81.4, 86.0]	844	53.0	[48.0, 58.4]
Darling Downs	2007-2011	67,187	79.9	[79.2, 80.5]	2,700	47.0	[44.3, 49.8]
Sunshine Coast	2007-2011	97,130	91.2	[90.6, 91.8]	1,435	38.4	[35.1, 41.9]
West Moreton	2007-2011	113,442	82.3	[81.7, 82.8]	2,736	45.0	[42.3, 47.9]
Metro North	2007-2011	234,962	84.0	[83.6, 84.4]	4,025	40.2	[38.1, 42.4]
Metro South	2007-2011	252,256	83.2	[82.9, 83.6]	4,736	41.1	[39.1, 43.1]
Gold Coast	2007-2011	145,364	85.7	[85.2, 86.1]	1,720	24.0	[21.5, 26.6]

ASR Age-standardised participation rate, CI Confidence interval; ERP Estimated resident population over given time period; HHS Health Service Region

Table A4.2 Three-year age-standardised Pap smear participation rates for women aged 20 to 69 years by time-period and HHS

HHS Name	Time-period	Non-Indigenous			Indigenous		
		ERP	ASR/100	[95% CI]	ERP	ASR/100	[95% CI]
Torres and Cape	2006-2008	1,960	85.3	[81.0, 89.8]	3,976	58.3	[55.8, 60.8]
	2009-2011	2,178	84.7	[80.6, 88.9]	4,236	57.9	[55.5, 60.4]
Cairns and Hinterland	2006-2008	56,850	77.7	[77.0, 78.4]	6,167	46.4	[44.6, 48.3]
	2009-2011	60,149	77.1	[76.4, 77.8]	6,966	45.4	[43.8, 47.2]
North West	2006-2008	5,889	70.2	[68.0, 72.4]	2,155	35.9	[33.3, 38.7]
	2009-2011	6,301	69.7	[67.6, 71.9]	2,141	39.2	[36.4, 42.0]
Townsville	2006-2008	54,558	70.7	[70.0, 71.4]	4,016	34.9	[32.9, 37.0]
	2009-2011	58,733	69.8	[69.2, 70.5]	4,282	32.6	[30.8, 34.5]
Mackay	2006-2008	41,533	73.8	[73.0, 74.6]	1,741	37.0	[33.9, 40.3]
	2009-2011	44,491	70.2	[69.4, 71.0]	1,857	37.3	[34.3, 40.5]
Central West	2006-2008	3,151	67.0	[64.2, 69.9]	229	32.8	[24.8, 42.6]
	2009-2011	3,142	69.9	[67.0, 72.9]	279	41.2	[33.5, 50.3]
Central Queensland	2006-2008	47,013	70.6	[69.8, 71.3]	2,485	35.3	[32.7, 38.0]
	2009-2011	49,843	65.3	[64.6, 66.0]	2,618	33.2	[30.9, 35.7]
Wide Bay	2006-2008	53,532	68.1	[67.3, 68.8]	1,683	35.4	[32.4, 38.5]
	2009-2011	56,879	66.7	[66.1, 67.4]	1,913	33.3	[30.7, 36.2]
South West	2006-2008	6,100	71.7	[69.6, 73.9]	833	39.8	[35.4, 44.7]
	2009-2011	6,203	69.9	[67.8, 72.0]	855	41.0	[36.6, 45.8]
Darling Downs	2006-2008	65,542	68.4	[67.7, 69.0]	2,498	38.7	[36.1, 41.4]
	2009-2011	68,011	66.1	[65.5, 66.8]	2,809	37.7	[35.3, 40.2]
Sunshine Coast	2006-2008	92,820	79.2	[78.6, 79.8]	1,330	34.0	[30.7, 37.5]
	2009-2011	99,220	76.7	[76.1, 77.2]	1,489	30.8	[28.0, 33.9]
West Moreton	2006-2008	106,708	71.2	[70.7, 71.7]	2,554	39.2	[36.4, 42.2]
	2009-2011	116,887	67.8	[67.3, 68.3]	2,830	35.0	[32.6, 37.5]
Metro North	2006-2008	222,703	72.4	[72.1, 72.8]	3,776	34.5	[32.4, 36.7]
	2009-2011	241,049	69.4	[69.1, 69.8]	4,150	31.7	[29.9, 33.7]
Metro South	2006-2008	241,829	71.3	[70.9, 71.6]	4,509	35.8	[33.9, 37.9]
	2009-2011	257,491	68.9	[68.6, 69.2]	4,849	32.7	[31.0, 34.5]
Gold Coast	2006-2008	136,989	71.6	[71.2, 72.1]	1,590	20.1	[17.7, 22.7]
	2009-2011	149,302	70.3	[69.9, 70.7]	1,787	18.9	[16.8, 21.3]

ASR Age-standardised participation rate, CI Confidence interval, ERP Estimated resident population over given time period; HHS Health Service Region

Table A4.3 Two-year age-standardised Pap smear participation rates for women aged 20 to 69 years by time-period and HHS

HHS Name	Time-period	Non-Indigenous			Indigenous		
		ERP	ASR/100	[95% CI]	ERP	ASR/100	[95% CI]
Torres and Cape	2006-2007	1,914	69.8	[65.8, 73.9]	3,928	46.2	[43.9, 48.5]
	2008-2009	2,081	69.3	[65.5, 73.3]	4,118	44.9	[42.8, 47.1]
	2010-2011	2,214	72.1	[68.4, 76.0]	4,275	47.4	[45.2, 49.6]
Cairns and Hinterland	2006-2007	56,113	63.1	[62.4, 63.8]	6,046	36.5	[34.9, 38.2]
	2008-2009	58,947	63.9	[63.3, 64.5]	6,545	37.8	[36.2, 39.4]
	2010-2011	60,440	63.5	[62.9, 64.1]	7,107	36.2	[34.7, 37.8]
North West	2006-2007	5,798	56.9	[54.9, 58.9]	2,151	27.1	[24.8, 29.5]
	2008-2009	6,116	58.2	[56.3, 60.3]	2,150	28.6	[26.3, 31.1]
	2010-2011	6,369	54.4	[52.5, 56.3]	2,141	30.9	[28.5, 33.5]
Townsville	2006-2007	53,840	58.3	[57.7, 59.0]	3,988	28.7	[26.9, 30.6]
	2008-2009	56,773	58.9	[58.3, 59.6]	4,112	24.5	[22.9, 26.2]
	2010-2011	59,322	56.4	[55.8, 57.1]	4,344	25.9	[24.3, 27.6]
Mackay	2006-2007	41,012	61.2	[60.4, 61.9]	1,726	30.5	[27.7, 33.6]
	2008-2009	43,140	60.9	[60.1, 61.6]	1,791	30.6	[27.9, 33.6]
	2010-2011	44,885	56.0	[55.3, 56.7]	1,883	29.3	[26.7, 32.2]
Central West	2006-2007	3,154	54.9	[52.3, 57.5]	220	26.3	[18.9, 35.9]
	2008-2009	3,139	56.3	[53.6, 58.9]	253	32.8	[25.6, 41.5]
	2010-2011	3,140	56.7	[54.1, 59.4]	288	29.5	[23.2, 37.1]
Central Queensland	2006-2007	46,486	57.9	[57.2, 58.6]	2,457	28.3	[26.0, 30.8]
	2008-2009	48,628	57.0	[56.4, 57.7]	2,563	26.7	[24.6, 29.0]
	2010-2011	50,169	51.4	[50.7, 52.0]	2,638	25.7	[23.7, 27.9]
Wide Bay	2006-2007	52,777	55.0	[54.4, 55.7]	1,646	26.5	[23.9, 29.3]
	2008-2009	55,689	55.6	[55.0, 56.2]	1,797	29.7	[27.1, 32.5]
	2010-2011	57,152	53.6	[53.0, 54.2]	1,953	26.0	[23.7, 28.6]
South West	2006-2007	6,090	58.7	[56.8, 60.6]	843	31.4	[27.4, 35.7]
	2008-2009	6,140	57.7	[55.8, 59.6]	825	31.8	[27.9, 36.2]
	2010-2011	6,227	55.9	[54.0, 57.8]	869	30.0	[26.3, 34.0]
Darling Downs	2006-2007	65,113	56.0	[55.4, 56.6]	2,461	29.0	[26.7, 31.4]
	2008-2009	66,921	55.9	[55.3, 56.5]	2,624	31.8	[29.5, 34.2]
	2010-2011	68,297	53.6	[53.0, 54.1]	2,877	28.9	[26.8, 31.1]
Sunshine Coast	2006-2007	91,571	64.8	[64.3, 65.4]	1,307	28.3	[25.3, 31.6]
	2008-2009	96,569	65.6	[65.1, 66.1]	1,403	26.6	[23.9, 29.7]
	2010-2011	99,921	61.8	[61.3, 62.2]	1,520	24.4	[21.8, 27.2]
West Moreton	2006-2007	105,088	59.1	[58.7, 59.6]	2,519	31.8	[29.2, 34.6]
	2008-2009	111,961	57.3	[56.8, 57.7]	2,679	30.0	[27.7, 32.5]
	2010-2011	118,341	54.6	[54.2, 55.0]	2,881	27.7	[25.6, 30.0]
Metro North	2006-2007	219,528	60.3	[60.0, 60.6]	3,717	28.3	[26.3, 30.3]
	2008-2009	232,454	59.0	[58.7, 59.3]	3,952	26.7	[24.9, 28.6]
	2010-2011	243,647	56.3	[56.0, 56.6]	4,219	24.8	[23.2, 26.6]
Metro South	2006-2007	239,169	59.0	[58.6, 59.3]	4,455	29.5	[27.7, 31.4]
	2008-2009	250,114	58.4	[58.1, 58.7]	4,669	26.6	[25.0, 28.4]
	2010-2011	259,695	55.8	[55.5, 56.1]	4,910	26.1	[24.6, 27.8]
Gold Coast	2006-2007	134,644	58.1	[57.7, 58.5]	1,559	16.7	[14.5, 19.1]
	2008-2009	143,870	58.7	[58.3, 59.1]	1,682	15.6	[13.5, 17.8]
	2010-2011	150,925	56.4	[56.0, 56.8]	1,822	14.9	[13.0, 17.0]

ASR Age-standardised participation rate, CI Confidence interval, ERP Estimated resident population over given time period; HHS Health Service Region

Notes:

1. Pap smear participation data by HHS calculated as an aggregate of LGAs. Please refer to text for further details.

2. Participation rate (expressed as a percentage) is the number of women aged 20-69 screened at least once in each specified time-period and HHS divided by the averaged estimated eligible resident female population (ERP) for the same age group, time-period and HHS, age-standardised to the 2001 Australian standard population. Women who have had a hysterectomy are excluded from the eligible population.
3. Periods covered apply to calendar years

Appendix 5 Pap smear participation rates by Indigenous status and LGA, Queensland, 2006-2011

Table A5.1 Five-year locally smoothed Pap smear participation rates for women aged 20 to 69 years by LGA

LGA Name	Non-Indigenous			Indigenous		
	Women screened	ASR/100	95% CI	Women screened	ASR/100	95% CI
Torres Strait Island (R)	80	85.6	[48.2, 123.0]	772	72.3	[68.1, 76.6]
Torres (S)	263	87.1	[71.7, 102.6]	472	70.6	[65.4, 75.8]
Northern Peninsula Area (R)	48	87.5	[50.8, 124.1]	367	67.9	[62.0, 73.8]
Mapoon (S)	not shown	not shown	not shown	28	49.4	[29.3, 69.5]
Napranum (S)	not shown	not shown	not shown	20	36.6	[27.3, 45.9]
Weipa (T)	659	82.2	[61.7, 102.8]	103	62.2	[50.9, 73.5]
Lockhart River (S)	not shown	not shown	not shown	105	67.3	[54.8, 79.9]
Aurukun (S)	24	82.5	[49.1, 115.9]	142	40.8	[33.4, 48.2]
Cook (S)	671	82.5	[71.3, 93.8]	278	92.0	[84.1, 100.0]
Pormpuraaw (S)	not shown	not shown	not shown	151	81.7	[71.8, 91.5]
Hope Vale (S)	not shown	not shown	not shown	not shown	not shown	not shown
Kowanyama (S)	19	80.7	[52.4, 108.9]	212	68.7	[60.7, 76.8]
Wujal Wujal (S)	not shown	not shown	not shown	61	65.3	[49.9, 80.7]
Douglas (S)	2,724	90.6	[84.7, 96.5]	153	52.2	[43.9, 60.5]
Mornington (S)	20	84.0	[47.8, 120.2]	26	38.7	[31.2, 46.2]
Yarrabah (S)	not shown	not shown	not shown	416	65.5	[60.0, 71.1]
Cairns (R)	34,874	89.2	[87.3, 91.2]	1,810	45.6	[43.5, 47.8]
Mareeba (S)	4,374	95.8	[93.0, 98.6]	639	93.8	[88.6, 99.0]
Carpentaria (S)	253	84.0	[65.7, 102.3]	133	49.4	[41.1, 57.6]
Doomadgee (S)	not shown	not shown	not shown	165	51.1	[43.0, 59.1]
Tablelands (R)	5,412	92.3	[89.6, 95.1]	295	60.1	[54.1, 66.2]
Cassowary Coast (R)	5,613	84.8	[78.9, 90.7]	424	55.4	[50.4, 60.5]
Burke (S)	47	83.9	[60.7, 107.1]	26	53.3	[31.2, 75.4]
Croydon (S)	37	80.7	[58.6, 102.7]	not shown	not shown	not shown
Etheridge (S)	181	80.4	[63.0, 97.7]	not shown	not shown	not shown
Hinchinbrook (S)	1,799	72.2	[65.7, 78.7]	88	47.5	[37.7, 57.3]
Palm Island (S)	20	81.2	[53.6, 108.8]	261	44.9	[39.2, 50.7]
Townsville (C)	39,827	83.8	[81.8, 85.7]	1,178	39.8	[37.3, 42.2]
Mount Isa (C)	4,212	84.4	[75.6, 93.2]	631	55.7	[51.6, 59.9]
Burdekin (S)	3,521	83.6	[78.4, 88.8]	131	48.3	[40.1, 56.5]
Charters Towers (R)	2,748	94.0	[90.6, 97.4]	121	48.3	[39.9, 56.8]
Richmond (S)	174	86.5	[68.3, 104.6]	not shown	not shown	not shown
McKinlay (S)	199	83.8	[73.4, 94.1]	not shown	not shown	not shown
Whitsunday (R)	7,306	83.9	[81.9, 85.8]	144	37.2	[30.4, 44.0]
Cloncurry (S)	608	90.0	[78.7, 101.2]	138	66.8	[57.4, 76.2]
Flinders (S)	349	81.1	[68.4, 93.8]	not shown	not shown	not shown
Mackay (R)	25,452	86.3	[84.3, 88.2]	623	49	[45.2, 52.8]
Isaac (R)	4,363	75.4	[72.0, 78.8]	57	30.9	[20.5, 41.2]
Boulia (S)	64	81.3	[64.3, 98.3]	not shown	not shown	not shown
Winton (S)	276	85.1	[71.3, 99.0]	not shown	not shown	not shown
Livingstone (S)	6,331	79.2	[75.8, 82.6]	97	42	[32.8, 51.1]
Barcaldine (R)	675	81.3	[71.3, 91.3]	27	45.5	[28.5, 62.6]
Rockhampton (R)	15,830	79.3	[77.3, 81.2]	553	38.9	[35.3, 42.5]

LGA Name	Non-Indigenous			Indigenous		
	Women screened	ASR/100	95% CI	Women screened	ASR/100	95% CI
Longreach (R)	889	78.6	[70.8, 86.4]	24	39.4	[21.0, 57.8]
Central Highlands (R)	6,336	84.2	[81.4, 87.0]	154	53.1	[45.1, 61.1]
Woorabinda (S)	not shown	not shown	not shown	137	62.4	[53.5, 71.3]
Gladstone (R)	12,549	84.0	[80.6, 87.4]	228	42.7	[36.3, 49.2]
Diamantina (S)	47	81.8	[54.3, 109.3]	not shown	not shown	not shown
Blackall-Tambo (R)	500	82.9	[73.1, 92.7]	not shown	not shown	not shown
Banana (S)	3,133	82.5	[79.1, 85.9]	65	37.7	[26.3, 49.1]
Bundaberg (R)	19,191	83.5	[83.5, 86.5]	297	39.1	[34.3, 44.0]
Barcoo (S)	60	79.7	[64.6, 94.7]	not shown	not shown	not shown
North Burnett (R)	1,966	78.3	[73.9, 82.7]	113	68.3	[57.9, 78.7]
Fraser Coast (R)	18,711	79.1	[77.2, 81.1]	314	39.6	[34.3, 44.8]
Murweh (S)	980	85.7	[69.6, 101.7]	82	50.2	[39.4, 61.1]
Quilpie (S)	191	82.3	[62.3, 102.3]	not shown	not shown	not shown
Cherbourg (S)	not shown	not shown	not shown	197	63.1	[55.4, 70.9]
Gympie (R)	9,782	84.0	[82.0, 85.9]	128	44	[36.1, 52.0]
Noosa (S)	13,372	96.0	[94.0, 97.9]	39	31.8	[20.6, 43.0]
Sunshine Coast (R)	63,395	90.3	[88.3, 92.3]	398	37.2	[32.9, 41.4]
Maranoa (R)	2,751	82.7	[78.7, 86.6]	132	49.8	[41.0, 58.6]
Paroo (S)	274	81.7	[70.2, 93.1]	100	56.7	[45.2, 68.2]
Balonne (S)	893	84.2	[78.0, 90.4]	123	49.2	[40.6, 57.8]
Bulloo (S)	62	80.8	[66.7, 95.0]	not shown	not shown	not shown
South Burnett (R)	6,053	79.6	[77.6, 81.5]	152	44.5	[36.9, 52.0]
Toowoomba (R)	32,130	79.9	[77.9, 81.8]	622	44.5	[40.8, 48.2]
Western Downs (R)	6,032	80.3	[77.5, 83.1]	182	49.3	[42.1, 56.4]
Goondiwindi (R)	2,472	90.0	[86.6, 93.4]	81	52.7	[41.4, 64.0]
Somerset (R)	4,012	74.5	[71.7, 77.3]	68	48	[36.6, 59.4]
Southern Downs (R)	6,419	75.8	[73.8, 77.7]	103	36.7	[28.5, 44.9]
Ipswich (C)	35,069	79.8	[77.9, 81.8]	778	49.6	[46.1, 53.1]
Lockyer Valley (R)	6,548	72.7	[70.7, 74.6]	88	36.9	[26.7, 47.0]
Moreton Bay (R)	82,229	81.1	[79.1, 83.0]	781	36.8	[33.9, 39.7]
Brisbane (C)	278,488	86.7	[84.8, 88.7]	1,977	42.2	[40.3, 44.2]
Redland (C)	32,834	85.7	[83.7, 87.6]	276	38.9	[32.3, 45.5]
Logan (C)	58,805	75.9	[74.0, 77.9]	848	40.9	[37.9, 43.8]
Scenic Rim (R)	8,159	86.0	[84.1, 88.0]	112	46.6	[37.8, 55.5]
Gold Coast (C)	123,869	85.6	[83.7, 87.6]	412	23.7	[20.5, 27.0]

ASR Age-standardised participation rate, CI Confidence interval, LGA Local Government Region; (C) City; (R) = Regional Council (S) = Shire; (T) = Town

Notes:

1. Geographical boundaries for LGA based on 2015 Australian Statistical Geography Standard. Please refer to text for further details
2. Smoothed five-year Pap smear participation rates generated using Local EBS. Please refer to text for further details.
3. Cell counts where number of women screened is less than twenty and rates derived from them have been supressed to protect confidentiality. These suppressions are denoted by ‘not shown”.

Appendix 6 Prevalence of histologically confirmed high-grade abnormalities by Indigenous status and PHN, Queensland, 2006-2011

Table A6.1 Five-year age-standardised prevalence of hHGA for women aged 20 to 69 years by PHN

PHN Name	Time-period	Non-Indigenous			Indigenous		
		Women screened	ASR/1000	[95% CI]	Women screened	ASR/1000	[95% CI]
Northern Queensland	2007-2011	141,529	10.2	[9.8, 10.7]	9,420	21.0	[18.5, 23.8]
Central Queensland, Wide Bay, Sunshine Coast	2007-2011	171,406	9.4	[9.0, 9.8]	2,531	17.1	[13.3, 21.9]
Western Queensland	2007-2011	13,115	10.4	[9.1, 11.9]	1,705	18.9	[13.3, 26.5]
Darling Downs and West Moreton	2007-2011	102,542	8.6	[8.1, 9.1]	2,311	17.1	[13.3, 22.1]
Brisbane North	2007-2011	209,331	8.0	[7.7, 8.3]	1,671	19.6	[14.5, 26.2]
Brisbane South	2007-2011	245,324	7.6	[7.3, 7.9]	2,252	16.3	[12.2, 21.5]
Gold Coast	2007-2011	126,781	6.5	[6.1, 6.9]	450	24.5	[22.1, 27.2]

ASR Age-standardised prevalence (per 1000 screened women), CI Confidence interval, hHGA histologically confirmed high-grade abnormality, PHN Primary Health Network

Table A6.2 Three-year age-standardised prevalence of hHGA for women aged 20 to 69 years by time-period and PHN

PHN Name	Time-period	Non-Indigenous			Indigenous		
		Women screened	ASR/1000	[95% CI]	Women screened	ASR/1000	[95% CI]
Northern Queensland	2006-2008	115,885	8.8	[8.4, 9.4]	7,425	17.7	[14.8, 21.0]
	2009-2011	120,833	9.1	[8.6, 9.6]	7,688	19.8	[16.9, 23.0]
Central Queensland, Wide Bay, Sunshine Coast	2006-2008	142,039	7.9	[7.5, 8.4]	1,966	15.0	[10.5, 21.1]
	2009-2011	145,532	8.5	[8.1, 9.0]	1,999	16.1	[11.4, 22.2]
Western Queensland	2006-2008	10,780	7.7	[6.3, 9.3]	1,248	13.9	[7.8, 23.4]
	2009-2011	11,006	10.9	[9.2, 10.7]	1,331	17.7	[11.8, 26.2]
Darling Downs and West Moreton	2006-2008	84,053	7.7	[7.1, 8.2]	1,793	18.0	[13.3, 24.6]
	2009-2011	86,132	8.3	[7.7, 8.9]	1,825	14.4	[10.2, 20.3]
Brisbane North	2006-2008	170,017	7.1	[6.8, 7.5]	1,319	19.9	[13.1, 29.3]
	2009-2011	175,751	7.5	[7.2, 7.9]	1,344	16.1	[8.5, 19.9]
Brisbane South	2006-2008	200,254	6.9	[6.6, 7.2]	1,854	12.9	[8.4, 19.4]

	2009-2011	204,108	7.1	[6.8, 7.5]	1,734	13.4	[9.2, 19.3]
Gold Coast	2006-2008	99,819	5.3	[4.9, 5.7]	345	17.3	[7.2, 37.7]
	2009-2011	106,426	6.3	[5.8, 6.7]	353	23.0	[11.5, 44.3]

ASR Age-standardised prevalence (per 1000 screened women), CI Confidence interval, hHGA histologically confirmed high-grade abnormality, PHN Primary Health Network

Table A6.3 Two-year age-standardised prevalence of hHGA for women aged 20 to 69 years by time-period and PHN

PHN Name	Time-period	Non-Indigenous			Indigenous		
		Women screened	ASR/1000	[95% CI]	Women screened	ASR/1000	[95% CI]
Northern Queensland	2006-2007	93,708	8.1	[7.5, 8.7]	5,781	15.6	[12.4, 19.5]
	2008-2009	99,011	8.2	[7.7, 8.8]	5,898	17.0	[14.0, 20.5]
	2010-2011	98,484	8.2	[7.7, 8.8]	6,180	18.9	[15.6, 22.7]
Central Queensland, Wide Bay, Sunshine Coast	2006-2007	114,845	6.9	[6.4, 7.4]	1,511	16.3	[10.5, 24.4]
	2008-2009	121,617	7.6	[7.1, 8.1]	1,612	14.2	[9.1, 21.6]
	2010-2011	117,930	8.1	[7.6, 8.7]	1,556	13.7	[9.1, 20.2]
Western Queensland	2006-2007	8,683	8.2	[6.5, 10.2]	952	15.6	[7.6, 28.8]
	2008-2009	8,945	9.4	[7.6, 11.5]	998	16.0	[9.2, 23.0]
	2010-2011	8,740	8.7	[7.0, 10.5]	1,022	17.2	[10.6, 27.7]
Darling Downs and West Moreton	2006-2007	68,405	7.1	[6.5, 7.7]	1,355	17.5	[12.1, 25.6]
	2008-2009	70,325	7.1	[6.5, 7.7]	1,448	18.0	[12.5, 25.9]
	2010-2011	69,828	7.7	[7.0, 8.3]	1,414	13.2	[8.6, 20.3]
Brisbane North	2006-2007	139,117	6.6	[6.3, 7.1]	1,061	12.8	[7.0, 22.4]
	2008-2009	143,376	6.9	[6.5, 7.4]	1,063	21.8	[13.4, 33.7]
	2010-2011	142,927	7.3	[6.9, 7.7]	1,050	15.2	[9.3, 23.9]
Brisbane South	2006-2007	163,055	6.2	[5.9, 6.6]	1,486	10.0	[5.8, 17.0]
	2008-2009	167,870	6.5	[6.1, 6.9]	1,385	16.7	[10.4, 25.9]
	2010-2011	165,878	7.1	[6.7, 7.5]	1,392	13.6	[8.7, 20.8]
Gold Coast	2006-2007	79,430	5.1	[4.6, 5.6]	not shown	not shown	not shown
	2008-2009	85,549	4.5	[4.1, 5.0]	287	18.9	[7.6, 44.3]
	2010-2011	86,014	6.5	[5.9, 7.0]	276	24.5	[10.8, 51.7]

ASR Age-standardised prevalence (per 1000 screened women), CI Confidence interval, hHGA histologically confirmed high-grade abnormality, PHN Primary Health Network

Notes:

1. Number of hHGA by PHN calculated as an aggregate of LGAs. Please refer to text for further details.
2. Prevalence is the number of hHGA among women aged 20-69 in each specified time-period and PHN divided by the number of women screened for the same age group, time-period and PHN, stratified by Indigenous status and age-standardised to the 2001 Australian standard population (per 1000 screened women). Please see text for further details.

3. Periods covered apply to calendar years.
4. Cell counts where the numerator (number of hHGA) is less than five and rates derived from them have been supressed to protect confidentiality. These suppressions are denoted by ‘not shown”.

Appendix 7 Prevalence of histologically confirmed high-grade abnormalities by Indigenous status and HHS, Queensland, 2006-2011

Table A7.1 Five-year age-standardised prevalence of hHGA for women aged 20 to 69 years by HHS

HHS Name	Time-period	Non-Indigenous			Indigenous		
		Women screened	ASR/1000	[95% CI]	Women screened	ASR/1000	[95% CI]
Torres and Cape	2007-2011	2,041	11.0	[7.5, 15.6]	2,930	17.8	[13.8, 22.6]
Cairns and Hinterland	2007-2011	53,638	10.8	[10.0, 11.5]	3,852	19.8	[16.4, 23.8]
North West	2007-2011	5,388	9.8	[9.1, 14.3]	1,113	16.1	[10.3, 24.8]
Townsville	2007-2011	48,564	9.7	[9.0, 10.5]	1,814	28.4	[20.9, 37.9]
Mackay	2007-2011	37,216	9.7	[8.9, 10.5]	824	18.1	[10.6, 29.2]
Central West	2007-2011	2,544	9.8	[7.7, 14.7]	124	11.5	[6.0, 43.0]
Central Queensland	2007-2011	39,716	9.0	[8.3, 9.8]	1,163	15.3	[10.0, 23.1]
Wide Bay	2007-2011	44,447	9.1	[8.3, 9.9]	795	19.4	[12.6, 29.3]
South West	2007-2011	5,181	8.5	[6.5, 10.9]	468	26.5	[13.9, 47.4]
Darling Downs	2007-2011	53,235	7.7	[7.1, 8.4]	1,337	16.0	[11.3, 22.6]
Sunshine Coast	2007-2011	87,196	9.5	[8.9, 10.1]	576	16.1	[9.3, 27.5]
West Moreton	2007-2011	94,231	7.6	[7.2, 8.0]	1,278	18.9	[13.5, 26.2]
Metro North	2007-2011	199,180	7.9	[7.6, 8.2]	1,627	16.4	[12.0, 22.2]
Metro South	2007-2011	212,121	7.6	[7.3, 7.9]	2,013	18.5	[13.6, 24.7]
Gold Coast	2007-2011	124,952	6.5	[6.2, 6.9]	426	21.0	[11.3, 37.7]

ASR Age-standardised prevalence (per 1000 screened women), CI Confidence interval, hHGA histologically confirmed high-grade abnormality, HHS Health Service Region

Table A7.2 Three-year age-standardised prevalence of hHGA for women aged 20 to 69 years by time-period and HHS

HHS Name	Time-period	Non-Indigenous			Indigenous		
		Women screened	ASR/1000	[95% CI]	Women screened	ASR/1000	[95% CI]
Torres and Cape	2006-2008	1,671	12.8	[7.5, 20.4]	2,364	13.4	[8.3, 17.8]
	2009-2011	1,838	7.6	[4.6, 12.2]	2,443	16.4	[11.9, 22.0]
Cairns and Hinterland	2006-2008	44,322	8.6	[7.8, 9.5]	2,960	17.3	[13.0, 22.8]
	2009-2011	46,423	10.5	[9.6, 11.4]	3,169	20.3	[16.1, 25.3]
North West	2006-2008	4,265	9.3	[7.0, 12.3]	833	11.4	[6.3, 22.0]
	2009-2011	4,475	11.5	[9.0, 14.6]	861	18.7	[11.2, 30.4]
Townsville	2006-2008	38,986	8.4	[7.6, 9.3]	1,452	27.7	[19.1, 39.2]
	2009-2011	41,162	8.8	[8.0, 9.6]	1,395	23.1	[15.6, 33.1]
Mackay	2006-2008	30,885	9.3	[8.4, 10.4]	649	13.3	[7.0, 24.8]
	2009-2011	31,312	7.5	[6.6, 8.4]	681	16.9	[8.1, 31.3]
Central West	2006-2008	2,115	8.6	[5.3, 13.2]	not shown	not shown	not shown
	2009-2011	2,192	8.7	[7.1, 15.5]	not shown	not shown	not shown
Central Queensland	2006-2008	33,323	8.0	[7.1, 8.9]	893	15.8	[9.2, 26.5]
	2009-2011	32,570	8.3	[7.4, 9.3]	893	14.5	[8.1, 25.1]
Wide Bay	2006-2008	36,020	6.5	[5.7, 7.3]	610	17.9	[9.1, 32.5]
	2009-2011	37,584	9.1	[8.2, 10.2]	638	20.0	[11.5, 33.1]
South West	2006-2008	4,400	5.5	[3.7, 7.9]	343	16.7	[5.3, 40.8]
	2009-2011	4,339	10.3	[7.7, 13.5]	357	21.9	[10.3, 48.0]
Darling Downs	2006-2008	44,614	6.1	[5.4, 6.8]	1,031	18.2	[12.1, 28.4]
	2009-2011	44,708	8.0	[7.2, 8.8]	1,071	12.3	[7.5, 20.1]
Sunshine Coast	2006-2008	72,863	8.5	[7.8, 9.2]	464	11.3	[4.7, 23.2]
	2009-2011	75,528	8.1	[7.5, 8.8]	470	14.8	[7.0, 30.0]
West Moreton	2006-2008	76,201	7.4	[6.9, 8.0]	1,015	17.6	[11.2, 27.3]
	2009-2011	78,958	7.3	[6.8, 7.8]	990	18.5	[12.2, 27.7]
Metro North	2006-2008	161,862	7.2	[6.9, 7.6]	1,300	17.3	[11.8, 25.0]

	2009-2011	167,014	7.4	[7.1, 7.8]	1,279	13.4	[8.5, 20.6]
Metro South	2006-2008	173,035	6.8	[6.4, 7.1]	1,632	14.8	[9.0, 23.1]
	2009-2011	176,731	7.2	[6.9, 7.6]	1,577	16.8	[11.6, 23.9]
Gold Coast	2006-2008	98,264	5.3	[4.9, 5.7]	332	12.6	[4.6, 32.0]
	2009-2011	104,856	6.3	[5.9, 6.8]	337	22.8	[11.0, 45.2]

ASR Age-standardised prevalence (per 1000 screened women), CI Confidence interval, hHGA histologically confirmed high-grade abnormality, HHS Health Service Region

Notes:

1. Cell counts where the numerator (number of hHGA) is less than five and rates derived from them have been supressed to protect confidentiality. These suppressions are denoted by ‘not shown”.

Table A7.3 Two-year age-standardised prevalence of hHGA for women aged 20 to 69 years by time-period and HHS

HHS Name	Time-period	Non-Indigenous			Indigenous		
		Women screened	ASR/1000	[95% CI]	Women screened	ASR/1000	[95% CI]
Torres and Cape	2006-2007	1,334	10.5	[5.1, 21.3]	1,837	11.2	[5.7, 16.7]
	2008-2009	1,435	14.2	[9.1, 21.7]	1,848	14.5	[8.9, 19.8]
	2010-2011	1,578	3.9	[1.6, 8.4]	2,011	18.4	[13.0, 25.4]
Cairns and Hinterland	2006-2007	35,569	8.1	[7.2, 9.1]	2,251	15.7	[10.7, 22.5]
	2008-2009	37,782	8.7	[7.8, 9.7]	2,484	17.7	[13.3, 23.3]
	2010-2011	38,453	9.4	[8.4, 10.4]	2,529	17.5	[13.1, 23.2]
North West	2006-2007	3,363	10.0	[7.2, 13.7]	626	12.9	[6.4, 27.7]
	2008-2009	3,636	10.4	[7.7, 14.0]	650	15.2	[6.9, 31.6]
	2010-2011	3,477	8.9	[6.3, 12.4]	667	14.4	[7.3, 27.1]
Townsville	2006-2007	31,605	7.5	[6.6, 8.5]	1,170	24.2	[15.0, 37.2]
	2008-2009	33,489	8.0	[7.2, 9.0]	1,023	24.1	[15.2, 37.2]
	2010-2011	33,401	7.9	[7.0, 8.8]	1,114	21.0	[12.5, 33.3]
Mackay	2006-2007	25,200	8.5	[7.4, 9.6]	523	12.8	[5.8, 27.0]
	2008-2009	26,305	7.8	[6.8, 8.9]	543	9.4	[3.8, 22.7]
	2010-2011	25,027	7.1	[6.1, 8.2]	526	21.9	[10.1, 41.3]
Central West	2006-2007	1,729	7.7	[4.2, 13.0]	not shown	not shown	not shown
	2008-2009	1,761	9.0	[5.1, 14.6]	not shown	not shown	not shown
	2010-2011	1,781	9.3	[5.9, 15.6]	not shown	not shown	not shown
Central Queensland	2006-2007	26,966	7.4	[6.5, 8.5]	698	14.8	[7.4, 28.1]
	2008-2009	27,707	6.9	[6.0, 7.9]	690	15.1	[7.4, 29.2]
	2010-2011	25,712	8.4	[7.4, 9.6]	687	10.5	[5.0, 21.3]
Wide Bay	2006-2007	28,874	5.5	[4.7, 6.5]	437	24.2	[11.5, 45.6]
	2008-2009	30,801	7.9	[6.9, 9.0]	540	17.2	[8.2, 33.1]
	2010-2011	30,610	8.6	[7.5, 9.8]	500	13.9	[6.5, 27.4]
South West	2006-2007	3,591	6.3	[4.1, 9.4]	270	20.2	[4.9, 54.2]
	2008-2009	3,548	7.8	[5.2, 11.2]	268	23.0	[4.2, 42.9]
	2010-2011	3,482	8.0	[5.4, 11.5]	269	25.9	[11.0, 59.3]
Darling Downs	2006-2007	36,332	5.6	[4.9, 6.5]	755	17.1	[9.9, 32.5]
	2008-2009	37,287	6.2	[5.5, 7.1]	850	16.2	[10.0, 26.2]
	2010-2011	36,458	7.3	[6.4, 8.2]	836	11.7	[6.3, 21.4]
Sunshine Coast	2006-2007	59,148	7.3	[6.6, 8.0]	not shown	not shown	not shown
	2008-2009	63,229	7.7	[7.0, 8.5]	384	14.5	[4.8, 25.2]
	2010-2011	61,726	7.7	[7.0, 8.5]	370	18.4	[8.3, 38.3]
West Moreton	2006-2007	62,090	7.2	[6.6, 7.8]	807	15.9	[9.9, 26.4]
	2008-2009	63,727	6.9	[6.3, 7.6]	798	19.2	[11.0, 32.0]
	2010-2011	63,955	6.9	[6.3, 7.6]	782	16.5	[9.5, 28.1]
Metro North	2006-2007	132,328	6.7	[6.3, 7.2]	1,036	13.4	[7.5, 23.4]
	2008-2009	136,568	7.0	[6.6, 7.4]	1,039	15.3	[9.7, 24.0]
	2010-2011	135,929	7.2	[6.8, 7.7]	997	13.5	[7.6, 22.7]
Metro South	2006-2007	140,949	6.1	[5.7, 6.5]	1,308	10.0	[5.6, 17.6]
	2008-2009	145,197	6.4	[6.0, 6.8]	1,231	21.9	[13.6, 33.7]
	2010-2011	143,438	7.3	[6.8, 7.7]	1,252	14.3	[9.3, 21.8]
Gold Coast	2006-2007	78,165	5.2	[4.7, 5.7]	not shown	not shown	not shown
	2008-2009	84,221	4.5	[4.1, 5.0]	263	17.9	[6.8, 46.0]
	2010-2011	84,749	6.5	[6.0, 7.1]	264	23.7	[9.8, 52.2]

ASR Age-standardised prevalence (per 1000 screened women), CI Confidence interval, HHS Health Service Region

Notes:

1. Number of hHGA by HHS calculated as an aggregate of LGAs. Please refer to text for further details.

2. Prevalence is the number of hHGA among women aged 20-69 in each specified time-period and HHS divided by the number of women screened for the same age group, time-period and HHS, stratified by Indigenous status and age-standardised to the 2001 Australian standard population (per 1000 screened women). Please see text for further details.
3. Periods covered apply to calendar years.
4. Cell counts where the numerator (number of hHGA) is less than five and rates derived from them have been supressed to protect confidentiality. These suppressions are denoted by ‘not shown”.

Appendix 8 Rate of clinical investigation within two months of cytological high-grade abnormalities by Indigenous status and PHN or HHS, Queensland, 2006-2009

Table A8.1 Age-standardised rate of clinical investigation within two months of cHGA, for women aged 20 to 68 years by PHN

PHN Name	Non-Indigenous			Indigenous		
	Women with cHGA	ASR/100	[95% CI]	Women with cHGA	ASR/100	[95% CI]
Northern Queensland	2,724	40.5	[37.4, 43.9]	376	26.7	[19.0, 36.8]
Central Queensland, Wide Bay, Sunshine Coast	2,537	48.0	[43.9, 50.0]	89	46.0	[28.9, 84.1]
Western Queensland	266	39.2	[30.7, 51.1]	87	30.2	[11.1, 65.6]
Darling Downs and West Moreton	1,586	45.0	[39.5, 47.7]	97	44.0	[26.6, 67.9]
Brisbane North	2,984	49.1	[46.0, 52.5]	62	33.6	[19.0, 58.6]
Brisbane South	3,460	47.9	[45.0, 50.9]	66	45.0	[30.4, 72.4]
Gold Coast	2,099	27.5	[24.9, 30.3]	not shown	not shown	not shown

ASR Age-standardised rate (per 100 women, with cHGA), CI Confidence interval, cHGA cytological high-grade abnormalities, PHN Primary Health Network

Notes:

1. Number of cHGA by PHN calculated as an aggregate of LGAs. Please refer to text for further details.
2. Rate is the number of clinical investigation within two months of cHGA index smear among women aged 20-68 years, 2006-2009 by PHN divided by the number of women with cHGA for the same age group, time-period and PHN, stratified by Indigenous status and age-standardised to the 2001 Australian standard population (per 100 women). Please see text for further details.
3. Women followed-up for clinical investigation until 31 December 2010
4. Clinical investigation includes histological test or cervical cancer diagnosis
5. Periods covered apply to calendar years.
6. Cell counts where the numerator (number of clinical investigation within two months of cHGA index smear) is less than five and rates derived from them have been supressed to protect confidentiality. These suppressions are denoted by ‘not shown”

Table A8.2 Rate of clinical investigation within two months of cHGA, for women aged 20 to 68 years by HHS

HHS Name	Non-Indigenous			Indigenous		
	Women with cHGA	ASR/100	[95% CI]	Women with cHGA	ASR/100	[95% CI]
Torres and Cape	56	30.8	[16.5, 49.8]	93	29.7	[17.1, 56.8]
Cairns and Hinterland	1,028	39.7	[34.7, 45.2]	167	26.2	[15.9, 42.0]
North West	130	40.1	[25.6, 60.9]	62	27.8	[9.4, 63.1]
Townsville	951	30.7	[25.9, 36.2]	89	18.1	[9.3, 36.6]
Mackay	689	54.7	[47.9, 62.3]	27	30.3	[13.8, 59.7]
Central West	53	37.8	[22.4, 61.1]	not shown	not shown	not shown
Central Queensland	634	40.8	[35.0, 47.3]	34	34.2	[17.3, 61.9]
Wide Bay	637	43.1	[35.9, 46.9]	32	41.3	[21.8, 88.7]
South West	83	42.9	[25.5, 67.4]	22	15.8	[5.8, 37.2]
Darling Downs	783	35.6	[30.5, 41.3]	59	38.4	[20.5, 64.9]
Sunshine Coast	1,269	52.6	[48.1, 57.4]	24	45.0	[18.2, 90.5]
West Moreton	1,468	50.4	[45.9, 55.2]	47	47.1	[21.8, 87.8]
Metro North	2,833	49.9	[46.6, 53.3]	56	30.3	[17.3, 54.4]
Metro South	2,958	47.6	[44.5, 50.8]	63	46.0	[32.7, 92.8]
Gold Coast	2,084	27.0	[24.5, 29.8]	not shown	not shown	not shown

ASR Age-standardised rate (per 100 women, with cHGA), CI Confidence interval, cHGA cytological high-grade abnormalities, HHS Health Service Region

Notes:

1. Number of cHGA by HHS calculated as an aggregate of LGAs. Please refer to text for further details.
2. Rate is the number of clinical investigation within two months of cHGA index smear among women aged 20-68 years, 2006-2009 by HHS divided by the number of women with cHGA for the same age group, time-period and HHS, stratified by Indigenous status and age-standardised to the 2001 Australian standard population (per 100 women). Please see text for further details.
3. Women followed-up for clinical investigation until 31 December 2010
4. Clinical investigation includes histological test or cervical cancer diagnosis
5. Periods covered apply to calendar years.
6. Cell counts where the numerator (number of clinical investigation within two months of cHGA index smear) is less than five and rates derived from them have been supressed to protect confidentiality. These suppressions are denoted by ‘not shown”