

## **PROFILING THE 'MOBILE PHONE ONLY' POPULATION: A study of Australians with a mobile phone and no landline telephone**

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### **Abstract**

A growing proportion of Australians live in households that do not have a landline telephone and rely solely on a mobile phone for their telecommunications. The rapid emergence of these 'mobile phone only' households has led survey researchers to question whether current approaches to undertaking telephone surveys are reaching a representative sample of the population.

To investigate this matter further the Social Research Centre undertook an on-line survey of the mobile phone only population. The resultant estimates suggest that 14.7% of persons live in mobile phone only households – a finding that is generally in line with other published estimates regarding the size of this population.

This paper explores whether the mobile phone only population differs from a matched landline population in terms of demographic and socio-economic characteristics and across a range of selected social connectedness, health and attitudinal measures.

The findings from this study suggest that telephone surveys of the landline population still produce robust and reliable general population estimates. For particular sub-groups of the population, however, and young people in particular, the representativeness of estimates produced solely from landline based surveys is questionable.

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## Introduction

One of the emerging issues facing telephone survey practitioners is the proportion of the population residing in mobile phone only households. This population is not contactable via traditional telephone interviewing methods which rely on Random Digit Dialing (RDD) sample frames. This gap in the coverage of RDD sample frames is a problem if the resultant estimates are no longer considered representative of the broader population.

The impact of this under-coverage has not been fully explored in the Australian context. As such, this paper presents an initial attempt to measure the extent of this under-coverage and to determine what impact, if any, it has had on population survey estimates generated solely from households with a fixed-line telephone connection.

## Procedure

To explore this issue the Social Research Centre, in conjunction with the internet panel provider Research Now, conducted an on-line survey of members of Research Now's Valued Opinions residential internet panel. At the time of the survey, September 2008, the panel had approximately 145,000 active members.

In preparation for this survey, in March 2008 Research Now starting asking panelists about their use of mobile phones and whether or not their household had a fixed landline. By the time the survey was undertaken (September 2008) the question had been asked of approximately 68,000 panel members. The results (Table 1) show that 14.7% of panelists live in a mobile phone only household and 84.9% have a fixed-line telephone service. These findings align fairly closely with recently published estimates from the Australian Communications and Media Authority showing that 88% of households have a fixed-line telephone service<sup>2</sup>.

**Table 1: Mobile phone and landline status.**

Phone status	n=	%
Total	67,931	100.0
I only have a personal mobile (i.e. no landline in the household)	9,339	13.8
I only have a work mobile (i.e. no landline in the household)	617	0.9
I only have a landline in the household (i.e. no mobile phone)	2,458	3.6
I have a mobile (personal and/or work) and a landline in the household	55,249	81.3
I have no mobile and no landline	260	0.4

<sup>2</sup> Australian Communications and Media Authority, 2009.

Having established a method for identifying a sample of mobile phone households, a two-stage survey was implemented. The mobile phone only survey involved drawing a geographically representative sample of this population from the Research Now panel. To try and ensure a representative sample (and avoid over representing heavy internet users) invitations to participate in the survey were sent in small batches. A total of 6,284 invitations were sent to generate 1,006 returns.

At the same time a complementary survey of some 500 panelists with a landline telephone connection was also undertaken. Again a batched sample release strategy was adopted to try and ensure as representative a sample of panelists as possible. A total of 1,263 emails were dispatched to generate 507 completed returns.

### **Questionnaire**

The questionnaire used for this study covered a broad range of population health and contemporary social policy issues using questions sourced from reputable survey instruments. The broad topic domains were:

- Self-assessed health status
- Selected health conditions
- Cancer screening behaviors (not reported on in this paper)
- Access to medical services
- Tobacco and alcohol consumption
- Experiences of discrimination
- Community networks and social inclusion
- Personal safety
- Attitudes to immigration, and
- Attitudes to the environment.

### **The survey estimates**

This paper provides a profile of the mobile phone only and landline populations using both unweighted and weighted survey estimates. The weighted results from the survey of the landline population are also compared with the weighted results from a 'blended' sample comprising the mobile phone only respondents and the landline respondents.

In order to create the blended estimates, the unweighted mobile phone only responses were added to the unweighted landline responses in the appropriate proportions (see Table 2). These combined results were then weighted to population benchmarks.

This 'blending' of the two samples is an important aspect of the research design as it enables the differences between estimates generated from a landline sample and estimates generated from a blended landline and mobile phone only sample to be observed.

Table 2 shows the weighting parameters used to create the blended estimates. The differences in the prevalence of the mobile phone only population by age group is quite marked. In comparison with an overall prevalence figure of 14.7% (refer back to Table 1), some 26.6% of 16 to 24 year old panelists were mobile phone only. This estimate accords closely with recent Australian Communications and Media Authority data which show that 75 per cent of 16 to 24 year olds have a fixed-line telephone service in their house. This declines to 60 per cent amongst those who have moved out of the parental home.

**Table 2: Weighting parameters for the blended estimates.**

Age (in years)	Mobile only by age group %
16-24	26.6
25-34	19.8
35-44	11.4
45-54	8.7
55+	5.9

## Demographic characteristics

The demographic profile of the mobile phone only and the landline samples is provided in Table 3.

Based on the unweighted results, it is apparent that the mobile phone only sample is both significantly younger and significantly more likely to reside in a capital city than the landline sample.

Given the weighting parameters used for this survey these differences are controlled for in the weighted estimates.<sup>3</sup>

**Table 3: Sample profile by selected demographic characteristics.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
<b>Gender</b>			0.286		
Male	45.2	48.1		48.6	48.6
Female	54.8	51.9		51.4	51.4
<b>Age (in years)</b>			0.000		
16-24	21.8	8.9		15.0	15.0
25-34	31.2	14.6		16.7	16.8
35-44	22.2	19.9		18.1	18.1
45-54	16.5	19.1		17.0	17.1
55+	8.4	37.5		33.2	33.1
<b>State / Territory</b>			0.777		
New South Wales	34.2	33.9		34.4	34.6
Victoria	25.8	23.9		23.8	23.8
Queensland	17.8	16.8		17.3	17.4
South Australia	8.5	9.5		9.5	9.3
Western Australia	8.2	10.5		9.9	9.7
Tasmania	2.1	2.2		2.4	2.4
Australian Capital Territory	2.0	2.4		2.0	2.0
Northern Territory	1.5	1.0		0.7	0.9
<b>Region</b>			0.004		
Capital city	79.1	72.5		64.2	64.3
Other	20.9	27.5		36.0	35.7

x2 test; Values < 5% were coded as missing and excluded from the analysis.

<sup>3</sup> Throughout this report McNemar's test was used to assess the significance of the difference between the landline and blended samples.

## Selected household characteristics

The unweighted profile of the mobile phone only and landline samples by selected household characteristics (Table 4) shows that mobile phone only residents are much more likely to be living in rented accommodation (57.8% compared with 29.9%) and to have lived in their current dwelling for less than 12 months (33.4% compared with 9.1%) Mobile phone only households are also much more likely to be one person households or group households and much less likely to be couples with dependent children.

When the survey estimates are weighted and combined the differences between the landline sample and the blended sample are not statistically significant.

**Table 4: Sample profile by selected household characteristics.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
Base	1,006	507		507	1,513
	%	%		%	%
<b>Home ownership</b>			0.000		
Owned or Being Purchased	32.3	70.1		69.1	64.8
Public rental	17.2	7.5		8.3	8.8
Private rental	50.6	22.4		22.6	26.4
<b>Household composition</b>			0.000		
Couple Only	24.0	27.2		25.5	26.1
Couple with Dependent Children	16.6	28.4		30.8	27.5
Couple with non-Dependent Children	4.7	12.5		11.8	11.4
One Parent Family with dependent children	7.3	6.4		6.2	6.1
One Parent Family with non-dependent	1.8	4.2		3.7	3.6
Group Household	19.8	6.8		7.7	9.1
One Person Household	19.2	9.3		8.8	10.5
Other Household configuration	6.6	5.4		5.5	5.7
<b>Time in residence</b>			0.000		
Less than 1 year	33.4	9.1		10.6	13.0
Greater than 1 year but less than or equal	41.1	29.3		29.3	30.8
Greater than 5 years but less than or equal	13.3	23.1		22.6	21.6
Greater than 10 years	12.1	38.5		37.5	34.6
<b>Household income (per annum)</b>			0.047		
Less than \$20,000	8.5	5.3		4.9	5.6
\$20,000 < \$40,000	12.2	17.6		18.4	18.1
\$40,000 < \$60,000	19.1	14.2		13.6	14.4
\$60,000 < \$80,000	17.7	16.8		17.6	17.8
\$80,000 to \$100,000	13.6	16.8		16.5	16.0
\$100,000 or more	20.9	19.3		19.7	18.8
Refused	8.1	10.1		9.4	9.3

x2 test; Values < 5% were coded as missing and excluded from the analysis

## Employment status and educational attainment

A higher proportion mobile phone only respondents describe their current employment status as 'paid work' (68.3%) compared with 56.6% of those in landline households. A higher proportion, also, describe themselves as students (10.5% compared to 6.3%).

The differences in the unweighted educational profiles of the two samples are minor.

**Table 5: Sample profile by employment status and educational attainment.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
<b>Employment status</b>			0.000		
Self Employed	4.7	5.3		5.4	5.3
Employed For Wages, Salary Or Payment	63.6	51.3		51.3	52.0
Unemployed	4.9	1.6		1.5	1.9
Engaged In Home Duties	4.9	1.6		8.4	7.7
A Student	10.5	6.3		8.6	8.4
Retired	4.0	19.9		17.4	17.2
Unable To Work	5.0	0.1		7.4	7.5
<b>Educational attainment</b>			0.669		
Did not complete secondary school	17.5	19.4		19.8	19.5
Completed secondary school	22.4	21.5		22.7	23.0
Trade / Technical certificate	32.0	31.6		30.2	30.3
Bachelors degree or higher	28.2	27.5		27.1	26.8

x2 test; Values < 5% were coded as missing and excluded from the analysis

## Access to selected medical services and private health insurance

In terms of access to medical services, 33% of mobile phone only respondents needed to see a GP in the last 12 months but were unable to do so. The comparable statistic for the landline sample was 29.6% (not statistically significantly different). The extent to which mental health services have been utilised is also similar for the two samples 21.7% for the mobile phone only sample compared with 18.4% for the landline sample).

When it comes to private health insurance mobile phone only sample members were less likely to be covered (43.6%) compared to 53.7% of the landline sample.

When the survey estimates are weighted and combined the difference in private health insurance coverage between the landline sample and the blended sample is not statistically significant.

**Table 6: Private Health Insurance and access to selected medical services.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
Could not see a GP when needed in last 12	33.0	29.6	0.180	29.7	30.2
Covered by Private Health Insurance	43.6	53.7	0.000	52.4	50.0
Visited a mental health professional	21.7	18.4	0.128	18.6	18.7

x2 test; Values < 5% were coded as missing and excluded from the analysis

## Selected health characteristics

Given the differences in the age profiles of the samples it seems likely that the mobile phone only sample, being younger, will be less likely to be affected by certain age-related medical conditions. For instance, Table 7 (next page) shows that mobile phone only respondents were less likely to report suffering from high blood pressure, diabetes, heart disease, stroke, cancer, osteoporosis and arthritis.

When the data is merged and weighted the estimates produced from the landline sample and the estimates produced from the 'blended' sample are very similar.

**Table 7: Sample profile by selected health characteristics.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
<b>Self-assessed health</b>			0.911		
Excellent	11.3	10.7		10.7	10.7
Very Good	36.7	35.2		37.3	36.2
Good	32.8	33.2		32.2	32.7
Fair	15.3	16.6		15.7	16.2
Poor	3.8	4.4		4.2	4.4
<b>Medical conditions</b>					
Asthma	25.7	23.1	0.279	22.3	23.1
High Blood Pressure	18.1	31.6	0.000	29.5	29.4
Diabetes	5.2	11.7	0.000	11.1	10.9
High Blood Sugar	6.8	8.4	0.290	7.8	7.8
Heart Disease	2.6	5.2	0.010	4.4	4.6
Stroke	0.5	3.0	0.000	2.4	2.4
Cancer	3.2	6.0	0.012	5.6	5.5
Osteoporosis	2.8	6.8	0.000	6.2	6.2
Depression or Anxiety	32.3	30.4	0.454	29.8	30.2
Arthritis	14.2	28.4	0.000	26.1	25.9

x2 test; Values < 5% were coded as missing and excluded from the analysis

### Alcohol consumption

Table 8 (next page) shows that the mobile phone only sample was more likely to consume a higher number of standard drinks on a day when they had a drink (e.g. 13.5% usually having more than 6 drinks on a day when they usually have an alcoholic drink compared with 7.0% of the landline sample). The mobile phone only respondents also reported an increased likelihood of having driven over the legal blood alcohol limit in the last 12 months (10.1% 'likely' compared with 4.5%).

Again, when the survey estimates are weighted and combined the differences in alcohol consumption between the landline and the blended samples are not statistically significant.

**Table 8: Alcohol consumption.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
<b>Had an alcoholic drink in the last 12 months</b>					
Yes	85.8	86.2	0.824	86.6	86.3
<b>How often have an alcoholic drink</b>					
			0.288		
Every Day	6.7	8.6		7.8	8.0
5 To 6 Days A Week	7.8	9.7		8.9	9.0
3 To 4 Days A Week	14.0	14.6		13.3	13.8
1 To 2 Days A Week	28.2	22.6		23.0	23.7
2 To 3 Days A Month	18.4	16.9		17.2	17.4
About 1 Day A Month	8.5	9.0		9.8	9.0
Less Often Than 1 Day A Month	16.5	18.7		20.0	19.1
<b>No. of standard drinks usually consumed</b>					
			0.000		
13 or more	2.4	0.7		1.9	1.5
11 to 12	2.4	1.4		1.3	1.5
7 to 10	8.7	4.9		5.0	5.5
5 to 6	16.9	8.4		10.0	10.6
3 or 4	29.6	27.8		26.9	27.3
1 or 2	40.1	56.8		54.9	53.6
<b>Frequency of 6 or more standard drinks in a day (Males)</b>					
			0.017		
Everyday	1.8	1.8		1.8	1.9
4 To 6 Days A Week	3.1	2.3		2.0	2.2
2 To 3 Days A Week	8.8	7.8		7.4	7.6
About 1 Day A Week	13.0	6.0		7.7	7.9
2 To 3 Days A Month	12.4	7.8		9.1	9.3
About 1 Day A Month	11.1	9.6		10.0	10.1
Less Than Once A Month	27.5	31.7		30.5	30.0
Never	22.3	33.0		31.6	31.1
<b>Frequency of 4 or more standard drinks in a day</b>					
			0.000		
Everyday	1.3	0.5		0.4	0.5
4 To 6 Days A Week	1.8	2.8		2.5	2.5
2 To 3 Days A Week	6.8	1.9		1.6	2.4
About 1 Day A Week	11.7	7.0		6.8	7.6
2 To 3 Days A Month	15.0	7.0		7.3	8.5
About 1 Day A Month	10.1	8.0		9.6	8.7
Less Than Once A Month	31.5	33.3		34.1	33.0
Never	21.8	39.4		37.7	36.9
<b>Driving over the legal blood alcohol limit in last 12</b>					
			0.003		
Very Likely	4.3	1.4		1.5	1.9
Fairly Likely	5.8	3.1		4.2	4.3
Fairly Unlikely	6.0	3.8		3.2	3.6
Very Unlikely	12.9	13.9		13.1	13.4
Definitely Not	71.0	77.8		78.0	76.9

x2 test; Values &lt; 5% were coded as missing and excluded from the analysis

## Smoking status

In terms of smoking prevalence, the unweighted estimates show that mobile phone only respondents are significantly more likely to be smokers (either daily or less often) than residents of landline households. Again, however, when looking at the weighted estimates and comparing the landline and blended results the differences are not statistically significant (18.9% daily smokers in the landline sample compared with 20.5% daily smokers in the merged sample).

As an aside, it is interesting to note that the prevalence of smoking amongst this sample of on-line panelists (24.2% of those with a landline being either daily or occasional smokers) is considerably higher than current annual prevalence measures based on telephone surveys using RDD sample frames.

**Table 9: Smoking status.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
<b>Smoking status</b>			0.000		
I smoke daily	27.7	20.0		18.9	20.5
I smoke occasionally	6.8	4.2		3.9	4.3
I don't smoke now, but I used to	18.3	27.5		26.2	26.1
I've tried it a few times but never smoked regularly	12.0	10.1		12.0	11.5
I've never smoked	35.2	38.3		38.9	37.6
<i>Smoked &gt; 100 over lifetime<sup>^</sup></i>	66.3	79.7	0.001	74.1	75.0

x2 test; Values < 5% were coded as missing and excluded from the analysis

## Perceptions of safety and experiences of victimisation and discrimination

Generally speaking, mobile phone only sample members felt no more or less safe than landline sample members. This is evident with regard to safety ratings in their own home at day and night, in the streets and public places where they live and in general as they go about their daily business. Despite similar perceptions of safety, the unweighted comparisons show that mobile phone only sample members are more likely to report having been a victim of physical assault or robbery and to have experienced discrimination based on their national, ethnic or religious background.

**Table 10: Perceptions of safety and experiences of victimisation and discrimination.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
<b>Base</b>	<b>1,006</b>	<b>507</b>		<b>507</b>	<b>1,513</b>
	%	%		%	%
<b>How safe in own home during the day</b>			0.423		
Very safe	63.7	67.3		66.7	66.2
Safe	32.6	30.2		31.0	31.3
A little unsafe	2.9	2.2		2.0	2.1
Very unsafe	0.8	0.4		0.3	0.4
<b>... in own home at night</b>			0.525		
Very safe	43.8	47.7		46.6	46.3
Safe	44.6	42.0		42.6	43.3
A little unsafe	10.1	9.1		9.6	9.2
Very unsafe	1.5	1.2		1.2	1.2
<b>... in street and public places where you live (Day)</b>			0.228		
Very safe	35.6	36.5		36.8	36.9
Safe	49.9	50.5		49.8	49.7
A little unsafe	12.0	12.0		12.5	12.2
Very unsafe	2.6	1.0		0.9	1.1
<b>... in street and public places where you live</b>			0.855		
Very safe	11.6	10.9		11.0	11.4
Safe	38.0	38.6		38.0	38.3
A little unsafe	37.0	38.4		38.5	37.9
Very unsafe	13.4	12.1		12.5	12.5
<b>... as you go about your daily business</b>			0.847		
Very safe	23.4	24.7		25.8	25.3
Safe	65.6	63.4		62.6	63.1
A little unsafe	9.7	10.7		10.6	10.5
Very unsafe	1.3	1.2		1.0	1.1
<b>Selected victimisation measures</b>					
Victim of a house break in or burglary	41.1	40.6	0.862	38.5	39.4
Had a car, van, truck or motorcycle stolen	20.5	23.0	0.261	21.6	21.9
Victim of physical assault or robbery	27.7	20.2	0.002	19.0	20.2
Been a victim of a sexual assault	16.3	13.9	0.223	14.2	14.4
<b>Experienced discrimination in Australia</b>					
Yes – National or ethnic background	28.0	21.5	0.006	21.7	22.4
Yes – Religion	8.9	6.1	0.055	6.8	7.0

x2 test; Values < 5% were coded as missing and excluded from the analysis

## Selected social attitudes

Questions measuring respondents' views on immigration and their level of concern about the environment were included to ascertain whether there were differences between the samples in terms of selected contemporary social attitudes.

The unweighted results show that the mobile phone only respondents are more likely to be of the view that immigration makes Australia stronger and that immigrants should be given Australian government assistance to maintain their customs and traditions. They are also more likely to be of the view that immigrants should be involved in the politics of their former home country.

**Table 11: Selected social attitudes.**

	Unweighted			Weighted	
	Mobile only	Landline	p	Landline	Blended sample
Base	1,006	507		507	1,513
	%	%		%	%
<b>Attitudes to immigration</b>					
<i>Number of immigrants accepted into Australia ...</i>			0.104		
Too high	46.5	50.2		49.0	49.1
About right	27.0	29.1		28.8	28.6
Too low	7.6	5.4		5.7	5.7
No opinion/ don't know	18.8	15.3		15.7	15.8
<i>The balance of immigrants from different countries</i>			0.058	0.0	
Yes	30.7	29.2		30.4	30.0
<i>Immigration makes Australia stronger</i>			0.046		
Strongly Agree	12.2	8.8		9.7	9.6
Agree	35.2	31.1		30.1	30.6
Neither Agree or Disagree	26.5	29.3		28.6	28.8
Disagree	16.1	20.1		20.2	20.0
Strongly disagree	9.9	10.8		10.6	10.2
<i>Should be given gov't. help to maintain customs,</i>			0.011		
Strongly Agree	4.9	2.2		2.3	2.4
Agree	14.1	11.8		13.4	12.6
Neither Agree or Disagree	24.5	21.0		22.2	22.4
Disagree	27.9	30.9		29.5	29.8
Strongly disagree	28.6	34.1		31.3	31.3
<i>Should not get involved in politics of former home?</i>			0.000		
Strongly Agree	23.1	34.1		34.0	32.9
Agree	30.4	32.5		30.3	30.8
Neither Agree or Disagree	28.4	18.7		18.4	19.5
Disagree	13.6	11.2		12.5	11.9
Strongly disagree					
<b>Level of concern about the environment</b>			0.314		
Very concerned	27.8	29.0		28.5	28.1
Fairly concerned	39.6	40.4		40.9	40.5
Slightly concerned	27.8	24.2		22.9	23.7
Not at all concerned	4.8	6.4		6.5	6.4

x2 test; Values < 5% were coded as missing and excluded from the analysis

## Conclusion

In considering all of the above it would seem that, generally speaking, the exclusion of mobile phone only households from general community survey estimates does not, as yet, have a significant bearing on the overall results. This finding is consistent with recent US findings where an analysis by Keeter et al (2007) of four recent dual frame studies concluded that non-coverage due to cell-only "is currently not damaging estimates for the entire population." It would seem that this finding will hold true only for as long as the size of the mobile phone only population is relatively small and only if the attitudes and behaviours of those living in mobile phone only households do not differ from others of the same age group.

For surveys with a focus on particular population sub groups, however, more consideration will need to be given as to whether or not RDD-based telephone surveys provide a sufficiently representative sample. This is seemingly already the case for surveys of young people with this research showing that 26.6% of persons aged 16 to 24 years live in mobile phone only households.

Given that the proportion of 'mobile phone only' households is predicted to grow quite rapidly there is an obvious need for survey researchers to continue to monitor the impact that this may have on the representativeness of the estimates produced from traditional telephone survey methods.

The Social Research Centre is planning to launch an annual omnibus survey of the 'mobile phone only' population to continue to measure the size of this group and the extent to which they differ from or are similar to persons residing in households with a landline telephone connection.

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