

Key Findings

- **Awareness of Malaria:** Sixty three percent of the households in Sri Lanka are aware on the requirement to take malaria preventive medicines before travelling to a malaria endemic countries.
 - **Ownership of bed-nets:** Sixty nine percent of the households in Sri Lanka possess at least one mosquito net (treated or untreated), while all types of insecticide-treated nets (ITNs) are possessed by only 6 percent. On average, each household has 2 mosquito nets of any type.
 - Most of the insecticide-treated nets (91 percent) are donations and none-treated nets are purchased (93 percent).
- Use of ITNs:** Usage of any type of mosquito nets by under five year children (71 percent) shows a growth during this decade (2006-2016).
- Sixty percent of pregnant women slept under any type of mosquito net the night before the interview and shows an increase than 2006/007 SLDHS

Considerable progress has been made against malaria since the beginning of the century with the drastic decreases in cases and no indigenous case of malaria being reported since October 2012. Anti-malaria campaigns have been able to interrupt indigenous transmission of malaria during the years 2013-2016. Sri Lanka obtained the malaria-free certificate from WHO in 2016.

Currently, the biggest threat to the elimination efforts is the risk of resurgence due to imported malaria and the continuing receptivity in several parts of the country due to the persistence of malaria vectors. Over the past few years, most of the imported malaria cases were reported by foreign travelers or by Sri Lankan nationals returning from malaria endemic countries. With enhanced parasitological surveillance, 36 cases were reported in 2015 and 41 cases in 2016. The implications of the imported cases are discussed in the context of the challenges faced by the Anti-Malaria Campaign (AMC) and measures taken to prevent the reintroduction of malaria.

14.1 AWARENESS OF MALARIA

All households were interviewed in the 2016 SLDHS and quizzed whether the respondent have ever heard of malaria and essentialness to obtain malaria prevention treatment before traveling to countries that have a high prevalence of malaria. A responsible person in the household had answered for these questions. Table 14.1 presents that the ninety seven percent (97%) of households aware about the malaria and only three percent (3%) have never heard. Only 63 percent of households knew about the requirement to obtain malaria prevention treatment before traveling to countries that have a high prevalence of malaria. More attention should be given to educate people on the requirement to take preventive medicine before traveling to malaria endemic countries since that knowledge seems to be inadequate (37 percent of house holds were not aware).



Awareness of malaria	YES (%)	NO (%)	DON'T KNOW (%)
Ever heard of malaria	97.1	2.9	-
Essential to obtain malaria treatment before traveling in high prevalence countries	62.9	11.1	26.0

14.2 HOUSEHOLD OWNERSHIP OF MOSQUITO NETS

Ownership of insecticide-treated nets

Household with at least one insecticide-treated net (ITN). An ITN is defined as: (1) a factory- treated net that does not require any further treatment (long- lasting insecticidal net (LLIN) or (2) a net that has been soaked with insecticide within the past 12 months.

sample : Households

Full household ITN coverage

Percentage of households with at least one ITN for every two people.

sample : Households

All eligible households were visited during the 2016 SLDHS and information was obtained on the ownership of mosquito nets and, if so, how many. Respondents were also asked to show the mosquito nets they owned to the interviewer so that the interviewer could identify the type. There are two types of insecticide treated nets i.e. long lasting insecticide treated nets (LLIN) and temporary insecticide treated nets (Temporary ITN). The long lasting net is a factory-treated net that does not require any further treatment while the temporary insecticide treated net is a net that has been soaked with insecticide and will need to be re-soaked over time. Hence, all together these two types of nets are named as ITNs in this chapter. Table 14.2 presents the percentage of households with at least one mosquito net (normal net or ITN), the average number of nets per household, and the percentage of households with at least one net for every two people who slept in the household the previous night by background characteristics.

At the time of the 2016 SLDHS, 69 percent of the households had at least one mosquito net (normal net or ITNs). On average, each household has nearly 2 mosquito nets of any type (Table 14.2). In addition, almost half of the households (48 percent) had at least one net for every two persons who stayed in the household the night before the survey.

The household ownership of mosquito nets varies with residence. Households in the rural sector recorded the highest percentage of households with at least one type of mosquito net (72 percent compared to only 26 percent in the estates sector and 60 percent in the urban sector.). The use of ITNs is also higher in the rural areas and shows an inverse relationship with wealth. The same pattern can be observed in the previous SLDHS round (2006/07) but the all types of mosquito net usage was somewhat lower, 64 percent. The proportion of households possessing any type of mosquito nets and any ITNs in the estate sector is significantly lower than in other areas, perhaps due in part to the geographical variation (higher elevation and cooler climate) around the country.

The highest ownership of any type of mosquito net by district was reported for the Polonnaruwa district (97 percent), followed by Kurunegala (92 percent), Hambantota (88 percent), Kilinochchi (84 percent), Trincomalee (83 percent) and Anuradhapura (83 percent). Similarly, the lowest values were reported for Nuwara Eliya district (30 percent) due in part to the low prevalence of mosquitos and the high altitude of the district.

In terms of the household ownership of ITNs, the Trincomalee district has the highest proportion of households that possess ITNs (38 percent). Matale district shows a rapid growth in possession of ITNs compared to the SLDHS 2006/07 (up from just over 2 percent in 2006/07 to 21 percent in 2016), benefiting substantially from the donation of mosquito nets (see Table 14.2 below).

Table 14.2 Household possession of mosquito nets

Percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household last night, by background characteristics, Sri Lanka 2016

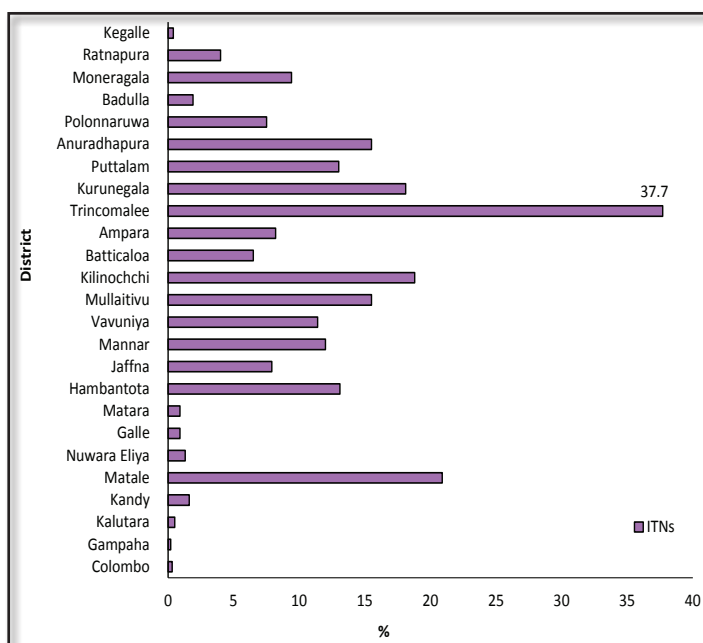
Background Characteristic	Percentage of households with at least one mosquito net			Average number of nets per household			Number of households	Percentage of households with at least one net for every two persons who stayed in the household last night			Number of households with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN) ¹	Long-lasting insecticidal net (LLIN)	Any mosquito net	Insecticide-treated mosquito net (ITN) ¹	Long-lasting insecticidal net (LLIN)		Any mosquito net	Insecticide-treated mosquito net (ITN) ¹	Long-lasting insecticidal net (LLIN)	
Residence											
Urban	59.5	2.6	2.5	1.3	0.0	0.0	4,309	38.8	0.5	0.4	4,299
Rural	72.4	7.5	7.2	1.7	0.1	0.1	21,778	52.3	2.4	2.3	21,645
Estate	26.2	0.2	0.2	0.4	0.0	0.0	1,122	9.4	0.1	0.1	1,119
District											
Colombo	57.5	0.3	0.2	1.3	0.0	0.0	2,722	40.1	0.0	0.0	2,715
Gampaha	71.1	0.2	0.2	1.6	0.0	0.0	2,815	49.7	0.0	0.0	2,806
Kalutara	69.3	0.5	0.5	1.6	0.0	0.0	1,618	47.2	0.1	0.1	1,607
Kandy	49.7	1.6	1.5	1.0	0.0	0.0	1,872	30.4	0.3	0.3	1,868
Matale	75.8	20.9	20.6	1.8	0.3	0.3	720	59.1	7.2	7.0	699
Nuwara Eliya	30.2	1.3	1.3	0.6	0.0	0.0	895	16.1	0.4	0.4	887
Galle	72.4	0.9	0.9	1.6	0.0	0.0	1,461	51.4	0.5	0.5	1,448
Matara	76.5	0.9	0.9	1.9	0.0	0.0	1,107	56.6	0.0	0.0	1,101
Hambantota	87.8	13.1	12.7	2.1	0.2	0.2	846	67.4	3.4	3.4	842
Jaffna	45.8	7.9	7.1	0.9	0.1	0.1	720	20.8	2.7	2.4	719
Mannar	62.0	12.0	11.9	1.1	0.2	0.2	126	25.8	4.9	4.9	126
Vavuniya	63.8	11.4	9.8	1.2	0.2	0.2	199	36.4	4.8	4.6	199
Mullaitivu	69.2	15.5	14.9	1.3	0.2	0.2	116	42.1	5.8	5.5	115
Kilinochchi	84.1	18.8	8.1	1.6	0.3	0.2	141	52.7	8.9	4.9	139
Batticaloa	57.8	6.5	6.4	0.9	0.1	0.1	699	22.8	2.0	1.8	696
Ampara	72.4	8.2	6.8	1.5	0.1	0.1	909	43.3	3.0	2.4	905
Trincomalee	83.3	37.7	37.1	1.8	0.6	0.6	507	55.2	13.6	13.6	504
Kurunegala	92.3	18.1	17.9	2.4	0.2	0.2	2,416	77.5	5.7	5.6	2,399
Puttlam	74.3	13.0	13.0	1.7	0.2	0.2	1,007	56.1	4.7	4.7	998
Anuradhapura	82.6	15.5	14.9	2.0	0.2	0.2	1,245	65.0	4.0	3.9	1,242
Polonnaruwa	96.5	7.5	6.5	2.6	0.1	0.1	577	85.2	2.6	2.2	576
Badulla	45.6	1.9	1.9	1.0	0.0	0.0	1,114	29.9	0.7	0.7	1,108
Moneragala	78.6	9.4	8.6	1.8	0.1	0.1	678	55.9	3.4	3.2	673
Ratnapura	64.7	4.0	4.0	1.4	0.0	0.0	1,567	42.5	0.5	0.5	1,556
Kegalle	62.8	0.4	0.2	1.5	0.0	0.0	1,134	44.8	0.2	0.1	1,133
Wealth quintile											
Lowest	54.7	7.9	7.4	0.9	0.1	0.1	6,149	32.8	3.3	3.1	6,084
Second	69.3	7.6	7.3	1.4	0.1	0.1	5,504	45.9	2.3	2.2	5,481
Middle	74.7	7.6	7.4	1.8	0.1	0.1	5,301	54.8	1.8	1.8	5,279
Fourth	75.5	5.8	5.6	1.9	0.1	0.1	5,164	56.7	1.7	1.7	5,143
Highest	70.6	2.8	2.7	1.9	0.0	0.0	5,094	54.6	0.8	0.7	5,077
Total	68.5	6.4	6.2	1.6	0.1	0.1	27,210	48.4	2.0	1.9	27,063

¹ An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a net that has been soaked with insecticide within the past 12 months

Figure 14.1 presents the possession of ITNs (LLINs and temporary ITNs) by district. The highest prevalence of these nets is observed in the districts of Trincomalee, Matale, Anuradhapura, Kurunegala, Kilinochchi, Mullaitivu and Hambantota.



Figure 14.1 Household ownership of ITNs (LLINs and Temporary ITNs) by district



By wealth quintile, household ownership of at least one mosquito net increases up to the fourth wealth quintile from 55 percent to 76 percent, although it is lower in the highest wealth quintile (71 percent). Households in the highest wealth quintile can afford to use other methods of mosquito control such as air-conditioning. The percentage of households owning either an ever-treated net or a temporary ITN declines with wealth quintile increasing and is highest among the poorest households. Although the absolute difference between lowest and highest figures is not that large because of the overall low percentage having these types of nets. This result reflects the government’s program of targeted distribution of ITNs, in communities at risk for malaria.

14.3 SOURCE OF MOSQUITO NETS

The population in general have access to buy normal mosquito nets from the market. Insecticide-treated mosquito nets (ITNs) are distributed by anti-malarial campaigns and by NGOs free of charge. In the 2016 SLDHS, respondents at the household level were asked about the source from which they obtained the mosquito net.

According to Table 14.3, the most common source of acquiring mosquito nets is purchasing. The majority of the untreated mosquito nets were obtained via direct purchase (93 percent).

Donation as a source of nets is highest in households of the rural sector (11 percent) compared with urban (6 percent) and estate (3 percent) households. By district, the percentage of households acquiring free nets is notably higher in the districts in the northern and eastern provinces.

The results presented in Figure 14.2 also indicate that most of the ITNs were acquired for free as a donation (91 percent) while only 9 were purchased or home made ITNs.

Figure 14.2 Sources of mosquito nets

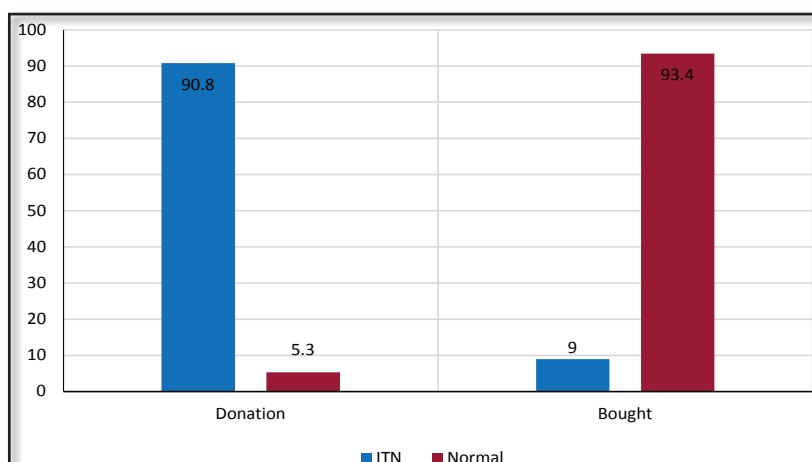


Table 14.3 Source of mosquito nets

Percent distribution of mosquito nets by source of net, according to background characteristics, Sri Lanka 2016

Background Characteristic	Donation	Bought	Home made	Other	Total	Number of mosquito nets
Type of net						
ITN ¹	90.8	9.0	0.1	0.0	100.0	2,274
Normal ²	5.3	93.4	1.1	0.2	100.0	40,082
Residence						
Urban	5.6	92.7	1.5	0.2	100.0	5,645
Rural	10.6	88.2	1.0	0.2	100.0	36,250
Estate	2.7	96.6	0.2	0.6	100.0	461
District						
Colombo	2.4	96.4	1.1	0.1	100.0	3,439
Gampaha	0.9	98.3	0.7	0.1	100.0	4,452
Kalutara	2.5	96.5	0.9	0.1	100.0	2,552
Kandy	5.9	93.2	0.4	0.5	100.0	1,920
Matale	20.7	79.1	0.1	0.1	100.0	1,325
Nuwara Eliya	5.6	93.6	0.4	0.3	100.0	498
Galle	3.3	94.3	1.8	0.6	100.0	2,377
Matara	2.4	95.7	1.3	0.6	100.0	2,156
Hambantota	11.6	87.2	0.9	0.3	100.0	1,745
Jaffna	30.6	63.0	6.3	0.0	100.0	630
Mannar	36.5	52.7	10.8	0.0	100.0	133
Vavuniya	41.7	57.4	1.0	0.0	100.0	246
Mullaitivu	42.3	55.5	2.1	0.0	100.0	153
Kilinochchi	58.6	38.3	3.1	0.0	100.0	225
Batticaloa	32.5	67.5	0.0	0.0	100.0	614
Ampara	19.0	80.5	0.5	0.0	100.0	1,356
Trincomalee	33.2	66.4	0.4	0.0	100.0	910
Kurunegala	11.3	87.5	0.9	0.3	100.0	5,684
Puttalam	16.2	81.8	2.0	0.0	100.0	1,678
Anuradhapura	16.0	82.9	1.1	0.0	100.0	2,550
Polonnaruwa	7.1	91.0	1.8	0.1	100.0	1,474
Badulla	9.4	89.9	0.6	0.2	100.0	1,151
Moneragala	22.2	77.5	0.2	0.1	100.0	1,238
Ratnapura	5.5	93.1	0.5	0.9	100.0	2,178
Kegalle	0.7	98.9	0.3	0.2	100.0	1,668
Wealth quintile						
Lowest	24.3	74.0	1.1	0.7	100.0	5,601
Second	12.6	86.2	1.0	0.3	100.0	7,978
Middle	9.0	89.8	1.0	0.2	100.0	9,340
Fourth	6.8	91.9	1.1	0.2	100.0	9,724
Highest	3.2	95.8	0.9	0.0	100.0	9,712
Total	9.9	88.9	1.0	0.2	100.0	42,356

¹ An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a net that has been soaked with insecticide within the past 12 months.

² Any net that is not an ITN



14.4 USE OF MOSQUITO NETS BY CHILDREN UNDER AGE 5

Young children are especially vulnerable to malaria and other mosquito borne diseases therefore it is important to protect them with mosquito nets at night. Table 14.4 shows that 71 percent of children under 5 years of age, slept under a mosquito net (treated or untreated) the night before the survey. This value is an increase over the 64 percent reported in 2006-07. Excluding northern province the figure for 2016 is 73 percent.

The data represents that the age of children and the use of mosquito nets are negatively related. (The lowest age group <12 months has the highest percentage (80%) of use of mosquito nets and highest age group 36-47 months has the lowest percentage (66%) of use of mosquito nets). Children in rural areas are more likely to sleep under a treated or untreated mosquito net (76 percent) than those in the urban (58 percent) and the estate (35 percent) sectors. Children from the Polonnaruwa district have the highest percentage who slept under a mosquito net (treated or untreated) the night before the surveys (95 percent), followed by those in Kurunegala (93 percent), and Hambantota (90 percent). The lowest percentages are observed in Jaffna (22 percent), and Nuwaraeliya (40 percent). The percentages of children who slept under an ITNs are very low (4 percent). The percentage of children who slept under a mosquito net (treated or untreated) during the night before the survey increases with household wealth up to the middle wealth quintile and declines afterwards (see Table 14.4).

Background Characteristic	Children under age 5 in all households			Number of children	Children under age 5 in households with at least one ITN ¹	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN ¹ last night	Percentage who slept under an LLIN last night		Percentage who slept under an ITN ¹ last night	Number of children
Age in months						
<12	79.6	3.6	3.3	1,496	44.7	119
12-23	73.7	3.3	3.1	1,596	47.9	109
24-35	71.4	4.3	4.3	1,739	55.0	136
36-47	66.2	3.4	3.4	1,710	55.9	105
48-59	65.6	3.0	2.7	1,734	49.7	104
Sex						
Male	71.4	3.5	3.3	4,278	51.5	287
Female	70.6	3.6	3.4	3,997	49.9	286
Residence						
Urban	58.2	1.5	1.5	1,307	44.8	44
Rural	75.6	4.1	3.9	6,598	51.2	529
Estate	35.4	0.0	0.0	369	*	0
District						
Colombo	59.7	0.4	0.4	720	*	5
Gampaha	75.0	0.2	0.2	776	*	1
Kalutara	75.1	0.3	0.3	517	*	4
Kandy	61.4	2.1	2.1	589	*	19
Matale	78.0	11.8	11.8	220	(49.9)	52
Nuwara Eliya	39.5	1.0	1.0	281	*	3
Galle	76.0	0.2	0.2	439	*	6
Matara	78.5	0.4	0.4	345	*	1
Hambantota	90.1	5.1	5.1	269	(53.1)	26
Jaffna	21.6	2.4	2.4	208	*	19
Mannar	46.1	2.4	2.4	42	*	4
Vavuniya	60.1	11.1	10.1	64	(82.5)	9
Mullaitivu	63.4	9.4	8.9	38	(57.3)	6
Kilinochchi	66.9	11.0	5.6	46	(55.7)	9
Batticaloa	44.3	2.4	2.4	248	*	14
Ampara	68.5	4.4	4.0	363	(55.0)	29
Trincomalee	64.0	21.7	20.7	191	52.9	79
Kurunegala	93.2	7.6	7.6	690	45.0	117
Puttalam	77.5	4.4	4.4	296	(44.1)	30
Anuradhapura	85.1	8.2	7.9	422	51.0	68
Polonnaruwa	94.9	5.6	4.5	188	*	13
Badulla	55.1	2.4	2.4	306	*	13
Moneragala	81.9	5.9	5.6	244	(59.9)	24
Ratnapura	69.3	1.6	1.6	450	*	20
Kegalle	79.5	0.7	0.4	320	*	2
Wealth quintile						
Lowest	56.9	4.8	4.5	1,662	55.7	143
Second	70.8	4.4	4.2	1,693	56.0	133
Middle	78.2	4.4	4.3	1,655	50.0	145
Fourth	76.6	2.9	2.8	1,769	45.8	113
Highest	72.3	0.8	0.8	1,495	(30.9)	40
Total	71.0	3.5	3.4	8,275	50.7	573

14.5 USE OF MOSQUITO NETS BY PREGNANT WOMEN

In order to prevent complications from malaria during pregnancy, such as anemia, low birth weight, and trans-placental parasitemia, all pregnant women are encouraged to sleep under mosquito nets. However, and as mentioned before, since October 2012, Sri Lanka has eliminated malaria and no native transmitted malaria patients are found. During the 2016 SLDHS, all ever-married women age 15-49 who were pregnant at the time of the survey were asked if they had slept under a mosquito net the night before the survey.

In national level 60 percent of the pregnant women age 15 to 49 slept under any net the night before the interview; in 2016 SLDHS, this figure is 62 percent excluding Northern Province. Use of any type of mosquito net is higher among pregnant women residing in the rural sector (64 percent) than urban (51 percent) and estate (16 percent) sectors. Pregnant women with higher educational level are more likely to have slept under any type of mosquito net the night before the interview (68 percent among those with degree and above) than those with lower educational levels. The percentage of pregnant women who slept under a mosquito net (treated or untreated) during the night before the survey increases with household wealth up to the middle wealth quintile and it declines at the highest quintile. (See Table 14.5)

Table 14.5 Use of mosquito nets by pregnant women

Percentages of pregnant ever married women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN); and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Sri Lanka 2016

Background Characteristic	Among pregnant women age 15-49 in all households				Number of women	Among pregnant women age 15-49 in households with at least one ITN ¹	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN ¹ last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN ¹ last night or in a dwelling sprayed with IRS ² in the past 12 months		Percentage who slept under an ITN ¹ last night	Number of women
Residence							
Urban	51.0	0.0	0.0	0.0	120	*	5
Rural	64.1	4.1	3.9	4.1	682	39.7	70
Estate	16.4	1.8	1.8	1.8	39	*	1
District							
Colombo	55.5	0.0	0.0	0.0	65	*	0
Gampaha	53.4	0.0	0.0	0.0	91	*	0
Kalutara	(32.0)	(0.0)	(0.0)	(0.0)	34	*	0
Kandy	52.1	5.9	5.9	5.9	49	*	3
Matale	(59.1)	(3.6)	(3.6)	(3.6)	29	*	5
Nuwara Eliya	*	*	*	*	20	*	0
Galle	(52.9)	(0.0)	(0.0)	(0.0)	42	*	0
Matara	(64.2)	(1.9)	(1.9)	(1.9)	38	*	1
Hambantota	(83.8)	(0.0)	(0.0)	(0.0)	29	*	1
Jaffna	*	*	*	*	20	*	2
Mannar	*	*	*	*	4	*	1
Vavuniya	*	*	*	*	5	*	1
Mullaitivu	*	*	*	*	2	*	0
Kilinochchi	*	*	*	*	4	*	0
Batticaloa	(37.3)	(0.0)	(0.0)	(0.0)	27	*	1
Ampara	(56.1)	(0.0)	(0.0)	(0.0)	44	*	5
Trincomalee	(46.8)	(15.8)	(15.8)	(15.8)	22	*	9
Kurunegala	90.0	6.9	6.9	6.9	80	*	16
Puttalam	(75.2)	(18.9)	(18.9)	(18.9)	29	*	8
Anuradhapura	(85.6)	(6.8)	(4.1)	(6.8)	55	*	9
Polonnaruwa	*	*	*	*	21	*	4
Badulla	(48.4)	(0.0)	(0.0)	(0.0)	30	*	0
Moneragala	(68.1)	(0.0)	(0.0)	(0.0)	27	*	3
Ratnapura	(60.7)	(4.3)	(4.3)	(4.3)	39	*	6
Kegalle	(56.6)	(0.0)	(0.0)	(0.0)	35	*	1
Education							
No education	*	*	*	*	3	*	1
Passed Grade 1-5	*	*	*	*	17	*	1
Passed Grade 6-10	61.6	4.1	4.1	4.1	330	(36.9)	37
Passed G.C.E.(O/L) or equivalent	55.1	3.3	3.3	3.3	206	*	15
Passed G.C.E.(A/L) or equivalent	61.9	1.6	0.9	1.6	212	*	13
Degree and above	68.0	6.5	6.5	6.5	73	*	10
Wealth quintile							
Lowest	46.0	2.4	2.4	2.4	142	*	14
Second	58.8	5.2	5.2	5.2	159	*	15
Middle	64.0	3.5	2.7	3.5	182	*	19
Fourth	66.7	4.0	4.0	4.0	209	*	21
Highest	60.2	1.4	1.4	1.4	150	*	7
Total	60.0	3.4	3.2	3.4	841	37.4	76

Note: Table is based on women who stayed in the household the night before the interview.

¹ An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a net that has been soaked with insecticide within the past 12 months

² Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization



