Verisense Sleep Research Summary

The same raw data processing algorithms that are used in Verisense have been used in top tier research over the past several years (https://cran.r-project.org/web/packages/GGIR/index.html). The advantage of using Verisense along with these algorithms is that you have confidence that these have been used extensively on a wide range of patient groups and the algorithms are accessible, understandable and have been verified by top researchers in the field. The following table provides a high level overview of research papers that have used the same algorithms used in Verisense.

Number of papers using Verisense sleep algorithms	14
Number of participants studies	24097
Age range of studies participants (average age in study)	11.0 – 69.1 years
Number of papers reporting Time in Bed or Sleep Efficiency	7
Number of papers reporting Time in Bed	7
Number of papers reporting Sleep Efficiency	4
Populations studied	Bipolar disorder Children Elderly General population Hypertension Obesity Postpartum mothers Stroke

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Verisense Sleep Algorithm Research Summary

Ref		Cohort	N	Age	
				Mean [yr]	Std [yr]
1	Correlations only	Bipolar + Control	88	44.64	11.5
2		Obese + Control	2598	63	9.6
		Diabetes + Control	2598	67.4	8.9
		Hypertension + Control	2598	65.7	9.7
3		Children	852	11	nr
4		Retintis Pigmentosa	33	54	14.5
5		Elderly	1986	65	4.9
6	Methods paper				
7	Methods paper				
8		Stroke	41	70	11
9		Postpartum mothers: Overweight	13	29.4	3.1
		Postpartum mothers: Normal weight	8	32.1	2.6
10		GP: Low physical activity	882	65.6	10.5
		GP: High physical activity	1767	59.6	8.8
		GP: High sedentary behaviour	893	64.6	10.6
		GP: Low sedentary behaviour	1756	60.1	9.1
11		Bipolar	46	46.8	11.1
		Bipolar: Control	42	42.5	11.9
12	Methods paper				
13	Validation study Correlations only	Sleep log n = 4094 Polysomnography n = 28	4122	69.3	5.7
14	Validation study	Sleep log n = 3752 Polysomnography n = 50	3802	69.1	5.6
		TOTAL N	**24097**		

Table 1 - Study size and age information for studies using the Verisense sleep algorithm. GP – general population, nr – not reported.

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Time in Bed

Ref	Cohort	Total time in bed	
		Mean [hr]	Std [hr]
2	Obese	6.9	1.1
2	Diabetes	6.9	1.2
2	Hypertension	7.1	1
3	Children	7.8	0.7
5	Elderly < 6hr sleep	5.3	0.7
5	Elderly > 9hr sleep	9.3	0.3
8	Stroke	10	1.2
9	Postpartum mothers: Overweight	5	2.5
9	Postpartum mothers: Normal weight	4.2	0.8
10	GP: Low physical activity	7.1	1
10	GP: High physical activity	7.1	1
11	Bipolar	8.7	1.5

Table 2 - Observed time in bed mean and standard deviation values for studies using the Verisense sleep algorithm.
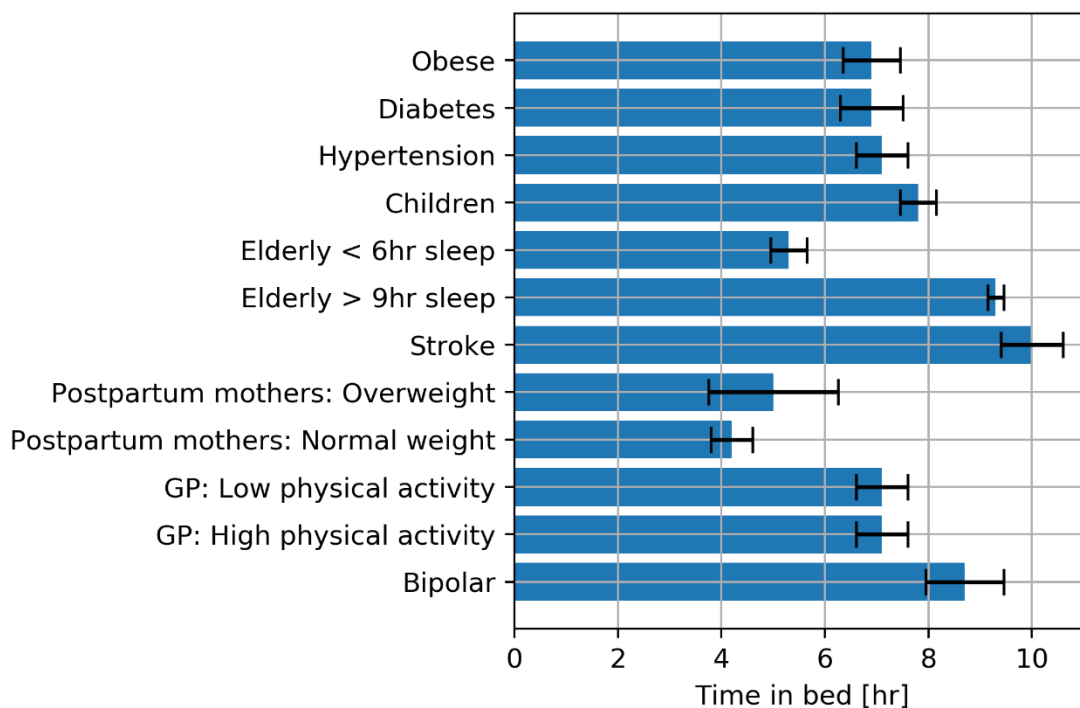

Figure 1 - Time in bed from published studies using the Verisense sleep algorithm. Blue bars represent means and black tick marks represent the standard deviation. GP – general population.

Sleep Efficiency

Ref	Cohort	Sleep Efficiency	
		Mean [%]	Std [%]
3	Children	84	5.1
8	Stroke	74	10
10	GP: Low physical activity	73.5	8.4
	GP: High physical activity	76.8	8
	GP: High sedentary behaviour	73.1	8.4
	GP: Low sedentary behaviour	77	7.9
11	Bipolar	85	75
	Bipolar: Control	88	4

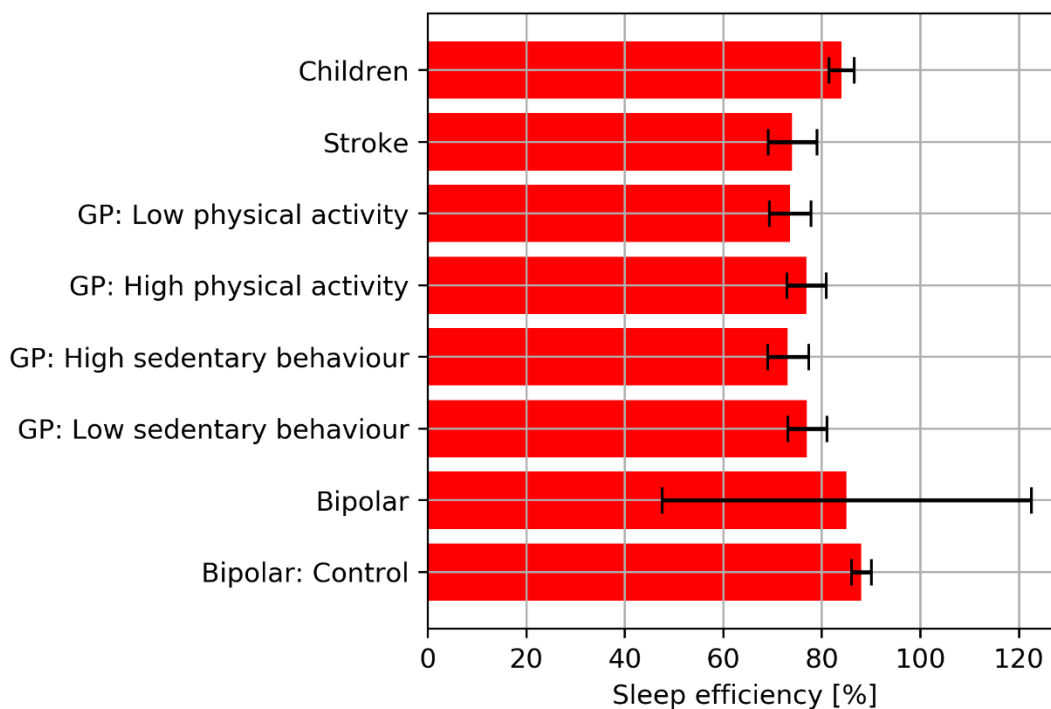*Table 3 - Published sleep efficiencies from studies using the Verisense sleep algorithm.*

Figure 2 - Published sleep efficiencies from studies using the Verisense sleep algorithm. Red bars represent mean and the tick bar width is the standard deviation. GP - general population.

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Sleep Variability

Ref	Cohort	Sleep Variability	
		Mean [hr]	Std [hr]
2	Obese	1.07	0.53
	Obese: Control	1.03	0.55
	Diabetes	1.02	0.57
	Diabetes: Control	1.03	0.53
	Hypertension	1.02	0.55
	Hypertension: Control	1.05	0.53
5	~65yr	0.89	0.4
	Elderly < 6hr sleep	1	0.6
	Elderly b/w 6-7hr sleep	0.88	0.4
	Elderly b/w 7-8hr sleep	0.87	0.4
	Elderly b/w 8- 9hr sleep	0.83	0.3
	Elderly > 9hr sleep	0.86	0.3

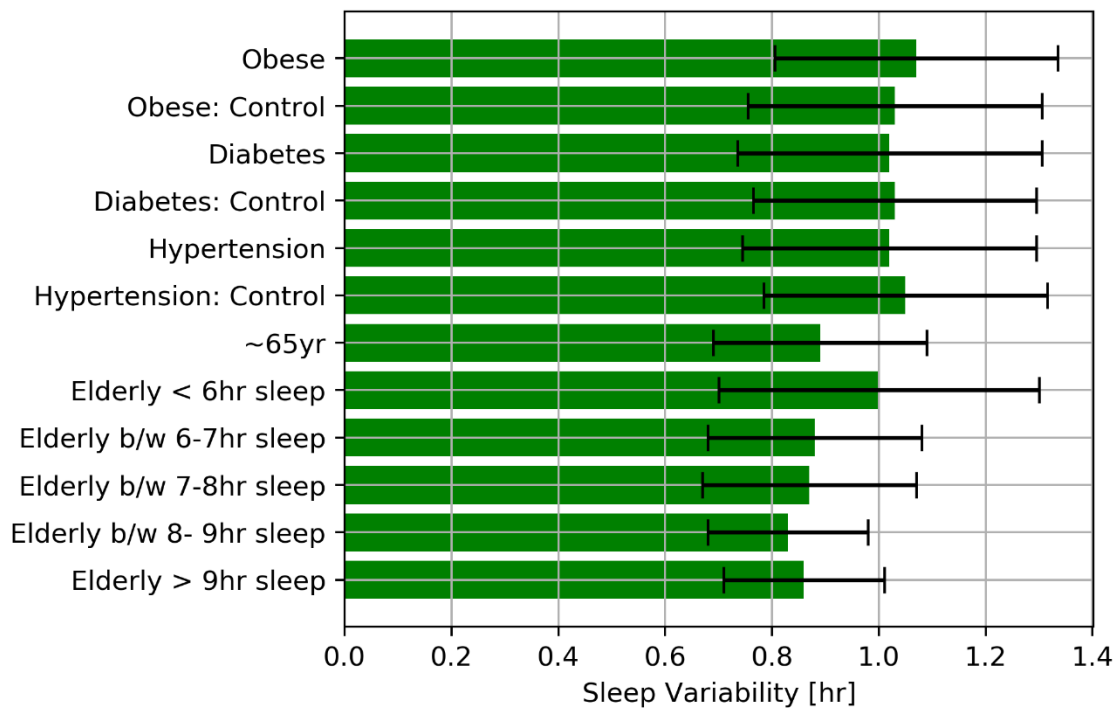*Table 4 - Published sleep variabilities from studies using the Verisense sleep algorithm.*

Figure 3 - Published sleep variabilities from studies using the Verisense sleep algorithm. Red bars represent mean and the tick bar width is the standard deviation. GP - general population.

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