Growth Spurts Occurring at Younger Ages for Both Girls and Boys

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Key Findings:

- Both girls and boys are reaching their peak growth spurt about a year younger than previously reported, at around 10.5 years old for girls and 12.8 years old for boys compared to previously reported peaks at 11.5 and 13.5 years old, respectively.

Studies have indicated that the onset of puberty is occurring earlier for both girls and boys.[1,2] Historically, the age at which the most significant height change occurs, known as peak height velocity or growth spurt, had been observed to be around age 11.5 for girls and age 13.5 for boys in 1998.[3]

To understand whether the typical age of growth spurts has shifted with the changing onset of puberty, we studied 11,282,238 pediatric patients aged 2 to 18 who had their height measured during an outpatient face-to-face visit between 2010 and 2023.

We found that the median growth spurt for girls after early childhood growth occurred at 10.5 years old, one year younger than previously reported, as illustrated in Figure 1. Similarly, for boys, we observed that the median growth spurt age was also nearly a year younger, around 12.8 years old.

Rate of Girls' and Boys' Height Increase by Age

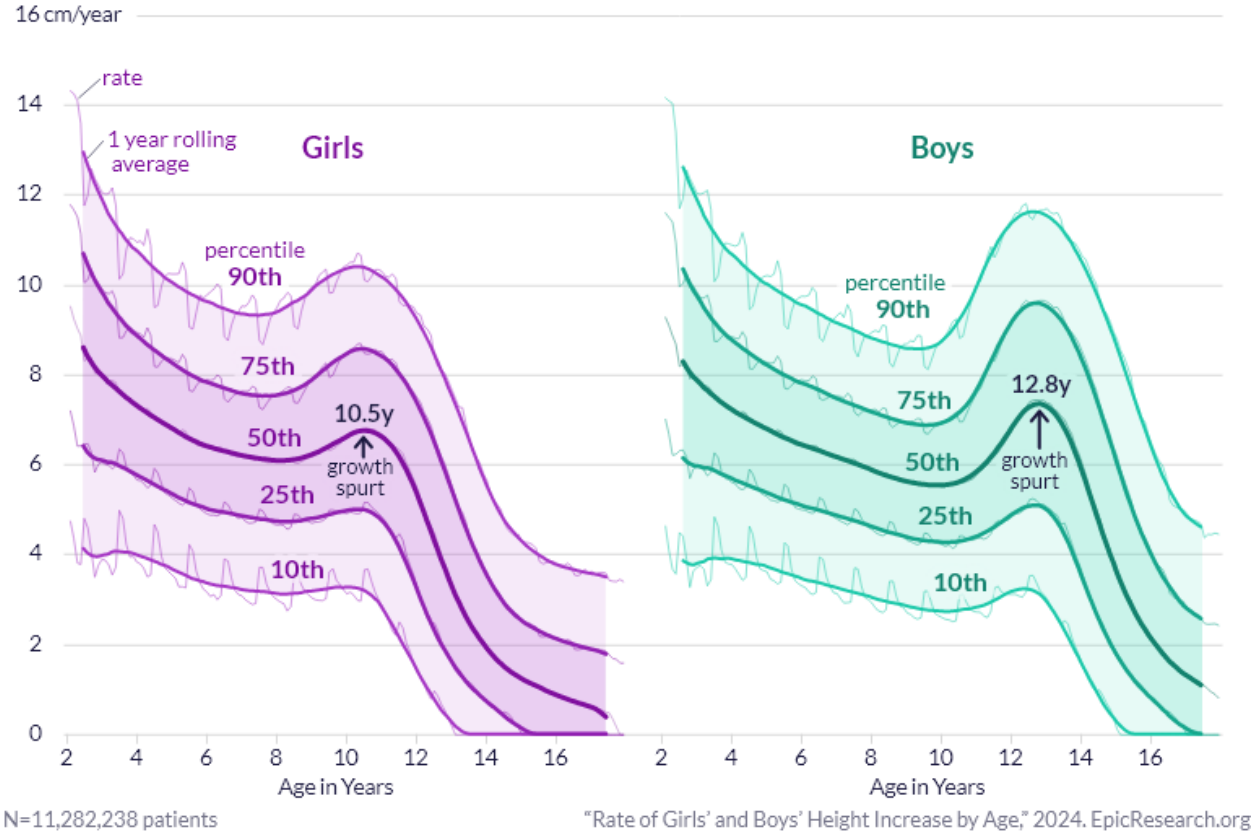

Figure 1. The rate of height increases in centimeters per year for girls and boys.

Interestingly, we found that conditions that affect stature, like Down syndrome and achondroplasia, do not affect the median age of growth spurt for girls or boys.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 249 million patient records from 1,400 hospitals and more than 32,900 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. Eckert-Lind C, Busch AS, Petersen JH, Biro FM, Butler G, Bräuner EV, Juul A. Worldwide Secular Trends in Age at Pubertal Onset Assessed by Breast Development Among Girls: A Systematic Review and Meta-analysis. JAMA Pediatr. 2020 Apr 1;174(4):e195881. doi: 10.1001/jamapediatrics.2019.5881. Epub 2020 Apr 6. PMID: 32040143; PMCID: PMC7042934.
2. Herman-Giddens ME, Steffes J, Harris D, et al. Secondary sexual characteristics in boys: Data from the pediatric research in office settings network. Pediatrics. 2012;130(5):e1058-e1068. doi:10.1542/peds.2011-3291
3. Abbassi V. Growth and Normal Puberty. Pediatrics. 1998;102(3):507-511.

Data Definitions

Term	Definition
Study period	2010 to 2023
Study population	Pediatric patients with at least two qualifying height readings in the **study period**. Height readings must be from outpatient face-to-face visits and be between 180 and 395 days apart (6-13 months). Height readings below 22 inches or above 96 inches were excluded. For the overtime analysis, only organizations contributing since the beginning of the **study period** were included.
Conditions that affect stature	Turner syndrome: A diagnosis with ICD-10-CM code Q96* Down syndrome: A diagnosis with ICD-10-CM code Q90*. Achondroplasia: A diagnosis with ICD-10-CM code Q77.4. Chondroectodermal dysplasia: A diagnosis with ICD-10-M code Q77.6 Growth hormone deficiency: A diagnosis with ICD-10-CM code E23.0. Hypothyroidism (in adolescence): A diagnosis with ICD-10-CM code E03* Cushing syndrome: A diagnosis with ICD-10-CM code E24*. Scoliosis: A diagnosis with ICD-10-CM code M41*. Osteogenesis imperfecta: A diagnosis with ICD-10-CM cod Q78.0. Congenital malformation syndromes associated with short stature: A diagnosis with ICD-10-CM code Q87.1*. Smith-Lemli-Opitz syndrome: A diagnosis with ICD-10-CM code E78.72. Amputations: A diagnosis with ICD-10-CM code S08*, S18*, S28*, S38*, S48*, S58*, S68*, S78*, S88*, or S98*
Rolling average	To calculate the rolling average, we averaged values within a 12-month window centered on each point.

Table 1. Rate of Girls' Height Increase by Age

Age	10th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Rolling Average 50th Percentile
2.1	4.7	7.2	9.5	11.8	14.3	N/A
2.2	4.4	6.9	9.2	11.7	14.3	N/A
2.3	3.8	6.4	9.0	11.5	14.1	N/A
2.4	3.8	6.4	8.9	11.1	13.6	N/A
2.5	4.8	6.5	8.3	10.1	11.8	8.58
2.6	4.6	6.5	8.4	10.1	12.0	8.43
2.7	4.1	6.3	8.4	10.3	12.6	8.29
2.8	3.5	5.8	8.0	10.1	12.4	8.17
2.9	3.8	6.0	8.1	10.0	12.2	8.07
3	3.9	6.1	8.0	9.9	12.1	7.99
3.1	3.9	6.0	7.9	9.8	12.0	7.91
3.2	3.8	6.0	7.9	9.8	12.0	7.82
3.3	3.6	5.9	7.9	9.9	12.2	7.76

3.4	3.7	6.0	7.8	9.7	11.8	7.70
3.5	5.0	6.4	7.6	8.8	10.1	7.63
3.6	4.8	6.3	7.5	8.8	10.2	7.56
3.7	4.2	6.0	7.5	9.0	10.8	7.49
3.8	4.0	5.8	7.4	9.1	11.1	7.43
3.9	4.0	5.8	7.4	9.0	11.0	7.37
4	3.8	5.7	7.3	8.9	11.0	7.31
4.1	3.8	5.7	7.3	8.9	11.0	7.25
4.2	3.7	5.6	7.2	8.8	10.9	7.20
4.3	3.5	5.5	7.3	9.1	11.2	7.14
4.4	3.6	5.5	7.2	8.9	10.9	7.09
4.5	4.7	5.9	7.0	8.2	9.5	7.04
4.6	4.5	5.8	7.0	8.2	9.5	6.99
4.7	4.0	5.6	6.9	8.3	10.0	6.94
4.8	3.7	5.4	6.9	8.4	10.2	6.90
4.9	3.6	5.3	6.9	8.4	10.3	6.85
5	3.6	5.3	6.8	8.4	10.2	6.80
5.1	3.5	5.2	6.8	8.3	10.2	6.76
5.2	3.3	5.1	6.7	8.3	10.3	6.71
5.3	3.3	5.1	6.8	8.5	10.5	6.66
5.4	3.3	5.2	6.7	8.3	10.3	6.62
5.5	4.2	5.5	6.5	7.7	9.1	6.57
5.6	4.1	5.4	6.5	7.6	9.0	6.53
5.7	3.6	5.1	6.5	7.8	9.4	6.50
5.8	3.4	5.0	6.4	7.9	9.8	6.46
5.9	3.2	5.0	6.4	7.9	9.7	6.43
6	3.2	4.9	6.4	7.9	9.8	6.40
6.1	3.1	4.9	6.4	7.9	9.9	6.38
6.2	3.1	4.9	6.4	7.9	9.9	6.35
6.3	3.0	4.9	6.4	8.0	10.0	6.33
6.4	3.1	4.9	6.4	7.9	9.9	6.31
6.5	3.9	5.2	6.3	7.5	8.9	6.29
6.6	3.9	5.1	6.3	7.4	8.8	6.27
6.7	3.5	5.0	6.2	7.5	9.1	6.25
6.8	3.2	4.9	6.2	7.6	9.3	6.23
6.9	3.1	4.8	6.2	7.6	9.4	6.21
7	3.1	4.8	6.2	7.6	9.5	6.19
7.1	3.0	4.7	6.2	7.6	9.5	6.18
7.2	2.9	4.7	6.2	7.6	9.6	6.16
7.3	2.9	4.7	6.2	7.7	9.8	6.14
7.4	2.9	4.7	6.2	7.7	9.7	6.13

7.5	3.7	5.0	6.1	7.3	8.8	6.12
7.6	3.7	5.0	6.1	7.2	8.7	6.11
7.7	3.4	4.8	6.1	7.4	9.0	6.10
7.8	3.2	4.7	6.0	7.5	9.2	6.09
7.9	3.1	4.7	6.1	7.5	9.4	6.08
8	3.0	4.7	6.1	7.6	9.5	6.08
8.1	3.0	4.7	6.1	7.6	9.7	6.07
8.2	2.9	4.7	6.1	7.7	9.7	6.07
8.3	2.8	4.6	6.1	7.7	9.8	6.08
8.4	2.9	4.6	6.1	7.7	9.8	6.09
8.5	3.6	4.9	6.1	7.4	9.1	6.10
8.6	3.6	4.9	6.0	7.4	9.0	6.11
8.7	3.3	4.8	6.1	7.5	9.4	6.13
8.8	3.2	4.8	6.1	7.7	9.7	6.15
8.9	3.1	4.7	6.2	7.8	9.9	6.18
9	3.0	4.7	6.2	7.9	10.0	6.20
9.1	3.0	4.7	6.2	7.9	10.0	6.24
9.2	3.0	4.7	6.3	8.0	10.2	6.27
9.3	3.0	4.8	6.3	8.2	10.3	6.31
9.4	3.0	4.8	6.4	8.3	10.4	6.34
9.5	3.6	5.0	6.3	8.0	9.8	6.39
9.6	3.7	5.0	6.4	8.0	9.8	6.43
9.7	3.4	5.0	6.4	8.2	10.1	6.47
9.8	3.3	5.0	6.5	8.3	10.2	6.51
9.9	3.2	4.9	6.6	8.5	10.4	6.55
10	3.1	4.9	6.6	8.5	10.4	6.60
10.1	3.2	5.0	6.7	8.6	10.5	6.65
10.2	3.1	4.9	6.7	8.6	10.5	6.69
10.3	3.0	4.9	6.7	8.7	10.7	6.72
10.4	3.0	4.9	6.8	8.7	10.7	6.73
10.5	3.7	5.2	6.8	8.5	10.1	6.74
10.6	3.7	5.2	6.8	8.5	10.1	6.74
10.7	3.4	5.1	6.8	8.5	10.2	6.72
10.8	3.2	5.0	6.8	8.6	10.3	6.69
10.9	3.0	4.9	6.7	8.5	10.3	6.66
11	2.9	4.8	6.7	8.5	10.3	6.61
11.1	2.7	4.7	6.6	8.4	10.2	6.55
11.2	2.5	4.6	6.5	8.3	10.2	6.48
11.3	2.3	4.4	6.4	8.4	10.2	6.39
11.4	2.2	4.4	6.4	8.3	10.1	6.28
11.5	2.5	4.5	6.3	8.1	9.6	6.16

11.6	2.4	4.3	6.2	7.9	9.5	6.03
11.7	2.0	4.0	6.0	7.9	9.6	5.88
11.8	1.9	3.8	5.9	7.7	9.5	5.72
11.9	1.6	3.6	5.7	7.6	9.5	5.54
12	1.4	3.3	5.5	7.5	9.4	5.36
12.1	1.3	3.1	5.3	7.4	9.3	5.16
12.2	1.1	2.8	5.0	7.2	9.1	4.94
12.3	0.9	2.6	4.8	7.0	9.0	4.73
12.4	0.8	2.5	4.6	6.9	8.9	4.52
12.5	1.0	2.5	4.5	6.6	8.4	4.31
12.6	0.9	2.3	4.2	6.4	8.2	4.09
12.7	0.7	2.1	3.9	6.2	8.1	3.89
12.8	0.5	1.9	3.8	6.0	8.0	3.68
12.9	0.4	1.8	3.6	5.8	7.9	3.48
13	0.2	1.6	3.3	5.5	7.7	3.28
13.1	0.0	1.4	3.1	5.3	7.5	3.10
13.2	0.0	1.3	2.9	5.0	7.3	2.93
13.3	0.0	1.3	2.8	4.9	7.3	2.77
13.4	0.0	1.2	2.6	4.7	6.9	2.61
13.5	0.0	1.2	2.5	4.4	6.5	2.48
13.6	0.0	1.1	2.4	4.2	6.3	2.35
13.7	0.0	1.0	2.3	4.0	6.2	2.23
13.8	0.0	0.9	2.1	3.9	6.0	2.12
13.9	0.0	0.8	2.0	3.7	5.8	2.01
14	0.0	0.7	1.9	3.6	5.7	1.91
14.1	0.0	0.6	1.8	3.4	5.4	1.81
14.2	0.0	0.6	1.8	3.3	5.2	1.72
14.3	0.0	0.5	1.7	3.2	5.1	1.64
14.4	0.0	0.5	1.6	3.1	5.0	1.57
14.5	0.0	0.5	1.5	2.9	4.7	1.49
14.6	0.0	0.5	1.4	2.8	4.6	1.43
14.7	0.0	0.4	1.4	2.7	4.5	1.37
14.8	0.0	0.2	1.3	2.6	4.4	1.32
14.9	0.0	0.2	1.3	2.6	4.5	1.27
15	0.0	0.0	1.2	2.5	4.3	1.23
15.1	0.0	0.0	1.2	2.5	4.3	1.19
15.2	0.0	0.0	1.2	2.5	4.3	1.15
15.3	0.0	0.0	1.1	2.4	4.2	1.11
15.4	0.0	0.0	1.1	2.4	4.1	1.07
15.5	0.0	0.0	1.0	2.2	3.9	1.04
15.6	0.0	0.0	1.0	2.2	3.8	1.00

15.7	0.0	0.0	1.0	2.2	3.8	0.96
15.8	0.0	0.0	0.9	2.2	3.9	0.92
15.9	0.0	0.0	0.9	2.2	3.9	0.89
16	0.0	0.0	0.9	2.1	3.8	0.86
16.1	0.0	0.0	0.8	2.1	3.8	0.83
16.2	0.0	0.0	0.8	2.1	3.8	0.80
16.3	0.0	0.0	0.8	2.1	3.8	0.77
16.4	0.0	0.0	0.8	2.1	3.8	0.74
16.5	0.0	0.0	0.7	1.9	3.6	0.72
16.6	0.0	0.0	0.7	1.9	3.5	0.69
16.7	0.0	0.0	0.7	1.9	3.6	0.67
16.8	0.0	0.0	0.7	1.9	3.7	0.64
16.9	0.0	0.0	0.6	1.9	3.6	0.62
17	0.0	0.0	0.6	1.9	3.6	0.59
17.1	0.0	0.0	0.6	1.9	3.6	0.56
17.2	0.0	0.0	0.6	1.9	3.6	0.51
17.3	0.0	0.0	0.5	1.9	3.6	0.44
17.4	0.0	0.0	0.5	1.9	3.6	0.38
17.5	0.0	0.0	0.5	1.8	3.4	N/A
17.6	0.0	0.0	0.3	1.7	3.4	N/A
17.7	0.0	0.0	0.2	1.7	3.4	N/A
17.8	0.0	0.0	0.0	1.6	3.5	N/A
17.9	0.0	0.0	0.0	1.6	3.4	N/A

Table 2. Rate of Boys' Height Increase by Age

Age	10th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Rolling Average 50th Percentile
2.1	4.6	7.0	9.3	11.6	14.2	N/A
2.2	4.1	6.7	9.1	11.5	14.1	N/A
2.3	3.7	6.2	8.9	11.4	14.0	N/A
2.4	3.6	6.2	8.7	10.9	13.4	N/A
2.5	4.5	6.3	8.2	10.0	11.7	8.44
2.6	4.4	6.3	8.2	10.0	11.9	8.30
2.7	3.9	6.2	8.2	10.2	12.6	8.16
2.8	3.3	5.7	7.9	10.1	12.4	8.05
2.9	3.6	5.9	8.0	10.0	12.2	7.95
3	3.7	6.0	7.9	9.8	12.0	7.88
3.1	3.8	5.9	7.8	9.7	12.0	7.80
3.2	3.7	5.9	7.8	9.7	12.1	7.72
3.3	3.3	5.8	7.8	9.8	12.1	7.66

3.4	3.4	5.8	7.7	9.5	11.7	7.58
3.5	4.8	6.3	7.5	8.8	10.1	7.52
3.6	4.6	6.2	7.5	8.8	10.2	7.45
3.7	4.1	5.9	7.4	8.8	10.7	7.39
3.8	3.8	5.7	7.3	8.9	10.9	7.33
3.9	3.8	5.7	7.3	8.9	10.9	7.28
4	3.8	5.6	7.2	8.9	10.9	7.23
4.1	3.7	5.6	7.2	8.8	10.9	7.18
4.2	3.6	5.5	7.1	8.8	10.9	7.13
4.3	3.4	5.5	7.2	9.0	11.2	7.09
4.4	3.5	5.5	7.2	8.8	10.9	7.05
4.5	4.6	5.9	7.0	8.1	9.5	7.00
4.6	4.5	5.8	7.0	8.1	9.5	6.96
4.7	3.9	5.6	6.9	8.3	9.9	6.92
4.8	3.7	5.4	6.9	8.3	10.1	6.88
4.9	3.7	5.3	6.8	8.3	10.2	6.83
5	3.6	5.3	6.8	8.3	10.2	6.80
5.1	3.5	5.2	6.7	8.3	10.2	6.76
5.2	3.4	5.2	6.7	8.3	10.2	6.72
5.3	3.4	5.2	6.8	8.4	10.5	6.68
5.4	3.4	5.2	6.7	8.3	10.2	6.64
5.5	4.3	5.6	6.6	7.7	9.1	6.61
5.6	4.2	5.5	6.6	7.7	9.0	6.57
5.7	3.7	5.2	6.5	7.8	9.4	6.54
5.8	3.4	5.1	6.5	7.8	9.6	6.50
5.9	3.4	5.0	6.4	7.9	9.7	6.47
6	3.3	5.0	6.4	7.9	9.8	6.45
6.1	3.3	5.0	6.4	7.9	9.7	6.42
6.2	3.2	4.9	6.4	7.9	9.8	6.39
6.3	3.1	4.9	6.4	8.0	9.9	6.37
6.4	3.2	5.0	6.4	7.9	9.8	6.34
6.5	3.9	5.3	6.4	7.5	8.8	6.31
6.6	3.9	5.2	6.3	7.4	8.8	6.29
6.7	3.5	5.0	6.3	7.5	9.0	6.26
6.8	3.3	4.9	6.2	7.5	9.2	6.23
6.9	3.2	4.8	6.2	7.5	9.2	6.20
7	3.1	4.8	6.2	7.5	9.3	6.17
7.1	3.0	4.8	6.1	7.5	9.4	6.14
7.2	2.9	4.7	6.1	7.5	9.3	6.12
7.3	2.9	4.7	6.1	7.6	9.6	6.09
7.4	3.0	4.7	6.1	7.5	9.4	6.06

7.5	3.7	5.0	6.1	7.2	8.6	6.04
7.6	3.7	5.0	6.1	7.1	8.4	6.01
7.7	3.3	4.8	6.0	7.2	8.7	5.98
7.8	3.0	4.7	6.0	7.2	8.9	5.95
7.9	3.0	4.6	5.9	7.2	8.9	5.92
8	2.9	4.6	5.9	7.2	8.9	5.88
8.1	2.8	4.5	5.8	7.2	9.0	5.85
8.2	2.8	4.5	5.8	7.2	8.9	5.82
8.3	2.7	4.4	5.8	7.3	9.1	5.79
8.4	2.8	4.5	5.8	7.2	9.1	5.76
8.5	3.4	4.7	5.8	6.9	8.3	5.74
8.6	3.4	4.7	5.7	6.8	8.2	5.72
8.7	3.1	4.5	5.7	6.9	8.4	5.69
8.8	2.9	4.4	5.7	6.9	8.6	5.67
8.9	2.8	4.4	5.7	7.0	8.7	5.65
9	2.7	4.3	5.6	7.0	8.7	5.63
9.1	2.7	4.3	5.6	7.0	8.8	5.61
9.2	2.6	4.3	5.6	7.0	8.7	5.60
9.3	2.6	4.2	5.6	7.0	8.9	5.59
9.4	2.6	4.3	5.6	7.0	8.9	5.57
9.5	3.2	4.5	5.6	6.7	8.2	5.56
9.6	3.2	4.5	5.6	6.7	8.1	5.55
9.7	2.9	4.4	5.5	6.8	8.3	5.55
9.8	2.7	4.3	5.5	6.9	8.6	5.55
9.9	2.7	4.3	5.5	6.9	8.7	5.55
10	2.6	4.2	5.5	6.9	8.8	5.55
10.1	2.6	4.2	5.5	7.0	8.9	5.55
10.2	2.6	4.2	5.6	7.1	9.0	5.56
10.3	2.5	4.1	5.6	7.1	9.2	5.58
10.4	2.5	4.2	5.6	7.2	9.2	5.59
10.5	3.1	4.4	5.6	7.0	8.8	5.62
10.6	3.1	4.4	5.6	7.0	8.9	5.66
10.7	2.9	4.4	5.6	7.1	9.2	5.70
10.8	2.8	4.3	5.7	7.3	9.5	5.74
10.9	2.7	4.3	5.7	7.5	9.8	5.80
11	2.7	4.4	5.8	7.6	10.0	5.85
11.1	2.7	4.4	5.9	7.7	10.1	5.92
11.2	2.6	4.4	5.9	7.9	10.3	6.00
11.3	2.6	4.4	6.0	8.1	10.7	6.08
11.4	2.8	4.5	6.1	8.3	10.9	6.18
11.5	3.3	4.7	6.2	8.3	10.6	6.28

11.6	3.3	4.8	6.3	8.5	10.8	6.38
11.7	3.2	4.7	6.4	8.7	11.0	6.49
11.8	3.1	4.8	6.5	8.9	11.2	6.60
11.9	3.1	4.8	6.6	9.0	11.4	6.72
12	3.1	4.9	6.8	9.2	11.5	6.84
12.1	3.1	4.9	6.9	9.4	11.6	6.95
12.2	3.1	4.9	7.0	9.4	11.6	7.06
12.3	3.1	5.0	7.2	9.6	11.8	7.15
12.4	3.2	5.1	7.3	9.7	11.8	7.23
12.5	3.5	5.2	7.4	9.6	11.5	7.29
12.6	3.5	5.3	7.4	9.6	11.5	7.33
12.7	3.4	5.2	7.4	9.6	11.6	7.36
12.8	3.2	5.1	7.4	9.7	11.7	7.36
12.9	3.1	5.1	7.4	9.7	11.7	7.34
13	3.0	5.1	7.4	9.6	11.7	7.30
13.1	2.9	5.0	7.4	9.6	11.6	7.24
13.2	2.7	4.9	7.2	9.5	11.6	7.16
13.3	2.6	4.9	7.2	9.5	11.6	7.07
13.4	2.4	4.7	7.1	9.4	11.5	6.95
13.5	2.5	4.7	7.0	9.2	11.1	6.81
13.6	2.5	4.5	6.8	9.0	11.0	6.66
13.7	2.2	4.3	6.7	8.9	11.0	6.48
13.8	2.0	4.0	6.4	8.8	10.9	6.29
13.9	1.8	3.8	6.3	8.7	10.8	6.08
14	1.6	3.6	6.0	8.5	10.6	5.87
14.1	1.4	3.4	5.8	8.3	10.6	5.64
14.2	1.2	3.1	5.5	8.1	10.4	5.40
14.3	1.1	2.9	5.2	7.9	10.2	5.16
14.4	1.0	2.7	5.0	7.7	10.0	4.92
14.5	1.0	2.6	4.8	7.4	9.7	4.68
14.6	0.9	2.4	4.5	7.1	9.5	4.45
14.7	0.7	2.3	4.3	6.9	9.4	4.23
14.8	0.6	2.1	4.1	6.7	9.2	4.01
14.9	0.4	1.9	3.9	6.4	9.0	3.81
15	0.1	1.8	3.7	6.2	8.8	3.59
15.1	0.0	1.6	3.4	5.9	8.6	3.39
15.2	0.0	1.5	3.3	5.7	8.4	3.21
15.3	0.0	1.4	3.1	5.4	8.2	3.05
15.4	0.0	1.3	3.0	5.2	7.9	2.89
15.5	0.0	1.2	2.7	4.8	7.4	2.73
15.6	0.0	1.2	2.5	4.6	7.1	2.59

15.7	0.0	1.1	2.5	4.5	7.1	2.45
15.8	0.0	1.0	2.4	4.4	7.0	2.33
15.9	0.0	0.9	2.3	4.2	6.7	2.21
16	0.0	0.8	2.1	4.0	6.4	2.10
16.1	0.0	0.7	2.0	3.8	6.2	2.00
16.2	0.0	0.6	1.9	3.8	6.1	1.90
16.3	0.0	0.6	1.9	3.7	6.0	1.80
16.4	0.0	0.5	1.8	3.5	5.7	1.70
16.5	0.0	0.5	1.6	3.2	5.2	1.62
16.6	0.0	0.4	1.5	3.1	5.1	1.55
16.7	0.0	0.3	1.5	3.0	5.1	1.48
16.8	0.0	0.2	1.4	3.0	5.0	1.41
16.9	0.0	0.1	1.4	3.0	5.0	1.35
17	0.0	0.0	1.3	2.8	4.9	1.30
17.1	0.0	0.0	1.3	2.8	4.8	1.25
17.2	0.0	0.0	1.2	2.6	4.8	1.20
17.3	0.0	0.0	1.2	2.6	4.7	1.15
17.4	0.0	0.0	1.1	2.6	4.7	1.09
17.5	0.0	0.0	1.1	2.5	4.4	N/A
17.6	0.0	0.0	1.0	2.5	4.5	N/A
17.7	0.0	0.0	0.9	2.5	4.5	N/A
17.8	0.0	0.0	0.9	2.5	4.5	N/A
17.9	0.0	0.0	0.8	2.4	4.5	N/A