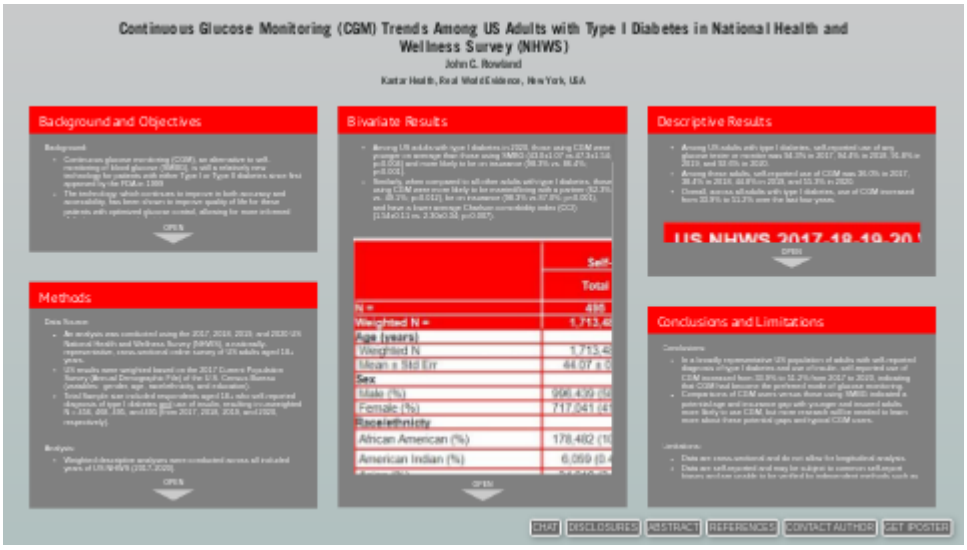
Continuous Glucose Monitoring (CGM) Trends Among US Adults with Type I Diabetes in National Health and Wellness Survey (NHWS)



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PRESENTED AT:

BACKGROUND AND OBJECTIVES

Background:

- Continuous glucose monitoring (CGM), an alternative to self-monitoring of blood glucose (SMBG), is still a relatively new technology for patients with either Type I or Type II diabetes since first approved by the FDA in 1999
- The technology, which continues to improve in both accuracy and accessibility, has been shown to improve quality of life for these patients with optimized glucose control, allowing for more informed diabetes management decisions.

Objectives:

- The objective of this study was to examine trends in CGM use among US adults with Type I diabetes from 2017 to 2020, with a particular focus on identifying potential gaps in use as of 2020 based on sociodemographic factors

METHODS

Data Source:

- An analysis was conducted using the 2017, 2018, 2019, and 2020 US National Health and Wellness Survey (NHWS), a nationally-representative, cross-sectional online survey of US adults aged 18+ years.
- US results were weighted based on the 2017 Current Population Survey (Annual Demographic File) of the U.S. Census Bureau (variables: gender, age, race/ethnicity, and education).
- Total Sample size included respondents aged 18+ who self-reported diagnosis of type I diabetes and use of insulin, resulting in unweighted N = 456, 468, 495, and 495 (from 2017, 2018, 2019, and 2020, respectively).

Analysis:

- Weighted descriptive analyses were conducted across all included years of US NHWS (2017-2020).
- Bivariate analyses were conducted solely for US 2020 sample, where respondents were stratified by CGM use versus SMBG use, as well as by CGM use versus all other respondents with type I diabetes.
- Given the multiple comparisons with CGM users with alpha = 0.05, a Bonferroni correction was utilized such that significance was established with $p < 0.05/3$.
- All analyses were performed in SAS Version 9.4.

BIVARIATE RESULTS

- Among US adults with type I diabetes in 2020, those using CGM were younger on average than those using SMBG (43.0±1.07 vs.47.3±1.54; p=0.004) and more likely to be on insurance (98.3% vs. 86.4%; p<0.001).
- Similarly, when compared to all other adults with type I diabetes, those using CGM were more likely to be married/living with a partner (62.3% vs. 49.1%; p=0.012), be on insurance (98.3% vs 87.0%; p<0.001), and have a lower average Charlson comorbidity index (CCI) (1.54±0.11 vs. 2.30±0.34; p=0.007).

	NHWS US 2020 Self-reported diagnosis of Type I Diabetes and Use of Insulin			
	Total	CGM	SMBG	Non-CGM (including SMBG)
N =	495	258	184	237
Weighted N =	1,713,480	877,266	658,642	836,214
Age (years)				
Weighted N	1,713,480	877,266	658,642	836,214
Mean ± Std Err	44.07 ± 0.86	43.03 ± 1.07	47.27 ± 1.54	45.15 ± 1.34
Sex				
Male (%)	996,439 (58.2%)	493,154 (56.2%)	380,180 (57.7%)	503,285 (60.2%)
Female (%)	717,041 (41.8%)	384,112 (43.8%)	278,462 (42.3%)	332,929 (39.8%)
Race/ethnicty				
African American (%)	178,482 (10.4%)	94,726 (10.8%)	51,267 (7.8%)	83,756 (10.0%)
American Indian (%)	6,059 (0.4%)	0 (0.0%)	6,059 (0.9%)	6,059 (0.7%)
Asian (%)	34,910 (2.0%)	15,738 (1.8%)	8,437 (1.3%)	19,172 (2.3%)
Hispanic (%)	286,914 (16.7%)	121,166 (13.8%)	108,791 (16.5%)	165,748 (19.8%)
Non-Hispanic White (%)	1,154,150 (67.4%)	623,584 (71.1%)	453,175 (68.8%)	530,566 (63.4%)
Mixed (%)	35,283 (2.1%)	16,602 (1.9%)	18,681 (2.8%)	18,681 (2.2%)
Other (%)	17,682 (1.0%)	5,450 (0.6%)	12,232 (1.9%)	12,232 (1.5%)
Marital status				
Single (%)	756,586 (44.2%)	330,551 (37.7%)	319,065 (48.4%)	426,035 (50.9%)
Married/living with partner (%)	956,894 (55.8%)	546,715 (62.3%)	339,577 (51.6%)	410,179 (49.1%)
University education				
Less than University education (%)	1,122,692 (65.5%)	547,596 (62.4%)	455,440 (69.1%)	575,096 (68.8%)
University education or higher (%)	590,788 (34.5%)	329,670 (37.6%)	203,202 (30.9%)	261,118 (31.2%)
Employed (FT/PT/SE)				
Not currently employed (%)	751,353 (43.8%)	360,264 (41.1%)	332,865 (50.5%)	391,089 (46.8%)
Employed (%)	962,127 (56.2%)	517,002 (58.9%)	325,777 (49.5%)	445,125 (53.2%)
Annual household income				
<$25K (%)	352,146 (20.6%)	161,065 (18.4%)	153,198 (23.3%)	191,081 (22.9%)
$25K to <$50K (%)	340,896 (19.9%)	162,497 (18.5%)	128,122 (19.5%)	178,399 (21.3%)
$50K to <$75K (%)	294,797 (17.2%)	127,209 (14.5%)	153,881 (23.4%)	167,588 (20.0%)
$75K or more (%)	644,615 (37.6%)	381,985 (43.5%)	190,660 (28.9%)	262,630 (31.4%)
Decline to answer (%)	81,026 (4.7%)	44,510 (5.1%)	32,781 (5.0%)	36,516 (4.4%)
Health insurance				
No (%)	123,843 (7.2%)	15,207 (1.7%)	89,466 (13.6%)	108,636 (13.0%)
Yes (%)	1,589,637 (92.8%)	862,059 (98.3%)	569,176 (86.4%)	727,578 (87.0%)
Body mass index (BMI) category				
Underweight (%)	68,312 (4.0%)	42,893 (4.9%)	21,818 (3.3%)	25,419 (3.0%)
Normal (%)	573,893 (33.5%)	279,192 (31.8%)	220,923 (33.5%)	294,701 (35.2%)
Overweight (%)	496,168 (29.0%)	232,641 (26.5%)	228,446 (34.7%)	263,527 (31.5%)
Obese (%)	472,923 (27.6%)	250,037 (28.5%)	174,367 (26.5%)	222,886 (26.7%)
Decline to provide weight (%)	102,184 (6.0%)	72,503 (8.3%)	13,088 (2.0%)	29,681 (3.5%)
Alcohol use				
Do not drink (%)	612,290 (35.7%)	321,579 (36.7%)	257,756 (39.1%)	290,711 (34.8%)
Drink alcohol (%)	1,101,190 (64.3%)	555,687 (63.3%)	400,886 (60.9%)	545,503 (65.2%)
Smoking behavior				
Never smoked (%)	834,011 (48.7%)	421,320 (48.0%)	336,236 (51.0%)	412,691 (49.4%)
Former smoker (%)	390,825 (22.8%)	170,540 (19.4%)	190,495 (28.9%)	220,285 (26.3%)
Current smoker (%)	488,644 (28.5%)	285,406 (32.5%)	131,911 (20.0%)	203,238 (24.3%)
Exercise behavior				
Do not exercise (%)	574,618 (33.5%)	289,513 (33.0%)	234,106 (35.5%)	285,105 (34.1%)
Regularly exercise (%)	1,138,862 (66.5%)	587,753 (67.0%)	424,536 (64.5%)	551,109 (65.9%)
Charlson comorbidity index (1987)				
Weighted N	1,713,480	877,266	658,642	836,214
Mean ± Std Err	1.91 ± 0.18	1.54 ± 0.11	1.74 ± 0.18	2.30 ± 0.34

DESCRIPTIVE RESULTS

- Among US adults with type I diabetes, self-reported use of any glucose tester or monitor was 94.3% in 2017, 94.4% in 2018, 91.8% in 2019, and 92.6% in 2020.
- Among these adults, self-reported use of CGM was 36.0% in 2017, 38.4% in 2018, 44.8% in 2019, and 55.3% in 2020.
- Overall, across all adults with type I diabetes, use of CGM increased from 33.9% to 51.2% over the last four years.

US NHWS 2017-18-19-20 Weighted Descriptive Results		Self-reported diagnosis of Type I diabetes and use of insulin in US NHWS			
		2017	2018	2019	2020
	Number of Respondents	456	468	495	495
	Weighted N	1549756	1554807	1651772	1713480
(DB135) Do you have a glucose tester or monitor that you use at home?	Yes	1462102	1468020	1515875	1586168
		94.3%	94.4%	91.8%	92.6%
	No	79231	81676	108664	101171
		5.1%	5.3%	6.6%	5.9%
	Do not know	8423	5111	27233	26141
		0.5%	0.3%	1.6%	1.5%
(DB136) Is the glucose tester or monitor that you use at home a continuous monitor?	Yes	525645	563423	678715	877266
		36.0%	38.4%	44.8%	55.3%
	No	832551	808536	727576	658642
		56.9%	55.1%	48.0%	41.5%
	Do not know	103906	96061	109584	50260
		7.1%	6.5%	7.2%	3.2%
(RU29) Are you familiar with web-connected glucose-monitoring systems that connect wirelessly with a smartphone, such as Accu-Chek ® Aviva Connect or One Touch Verio ® Sync Meter?	Yes, I am familiar and current using	300726	315629	449571	557074
		19.4%	20.3%	27.2%	32.5%
	Yes, I am familiar and currently not using, but I intend to in the future	331922	346110	429067	392595
		21.4%	22.3%	26.0%	22.9%
	Yes, I am familiar and currently not using and I do not intend to in the future	382846	340000	351142	482164
		24.7%	21.9%	21.3%	28.1%
	No, I am not aware	534262	553068	421992	281647
		34.5%	35.6%	25.5%	16.4%
(RU30) Would you be interested in having your glucose readings automatically and securely recorded on the Internet and your smartphone application for easy access for you, your family and doctor(s)?	Yes	726347	729562	915720	942471
		46.9%	46.9%	55.4%	55.0%
	No	532451	464729	413033	434902
		34.4%	29.9%	25.0%	25.4%
	Not sure	290958	360516	323019	336107
		18.8%	23.2%	19.6%	19.2%

CONCLUSIONS AND LIMITATIONS

Conclusions:

- In a broadly representative US population of adults with self-reported diagnosis of type I diabetes and use of insulin, self-reported use of CGM increased from 33.9% to 51.2% from 2017 to 2020, indicating that CGM had become the preferred mode of glucose monitoring.
- Comparisons of CGM users versus those using SMBG indicated a potential age and insurance gap with younger and insured adults more likely to use CGM, but more research will be needed to learn more about these potential gaps and typical CGM users.

Limitations:

- Data are cross-sectional and do not allow for longitudinal analysis.
- Data are self-reported and may be subject to common self-report biases and are unable to be verified by independent methods such as medical charts.

DISCLOSURES

John C. Rowland is an employee of Kantar Health, which administers the National Health and Wellness Survey and conducted this study and analysis.

ABSTRACT

Continuous Glucose Monitoring (CGM) Trends Among US Adults with Type I Diabetes in National Health andWellness Survey (NHWS)

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OBJECTIVES :
Continuous glucose monitoring (CGM), an alternative to self-monitoring of blood glucose(SMBG) for adults with type I or type II diabetes, has continued to improve in both accuracy andaccessibility since first approved by the FDA in 1999. This study examined trends in CGM among US adultswith type I diabetes from 2017 to 2020.

METHODS :
Data on US adults were analyzed from the 2017, 2018, 2019, and 2020 National Health andWellness Survey (NHWS), a nationally-representative, cross-sectional online survey. Analysis sample fromeach year included respondents who self-reported both diagnosis of type I diabetes and use of insulin.Results were weighted to be representative of the US population.

RESULTS :
Among US adults with type I diabetes, self-reported use of any glucose tester or monitor was 94.3% in 2017, 94.4% in 2018, 91.8% in 2019, and 92.6% in 2020. Among these adults, self-reported use ofCGM was 36.0% in 2017, 38.4% in 2018, 44.8% in 2019, and 55.3% in 2020. Overall, across all adults withtype I diabetes, use of CGM increased from 33.9% to 51.2% over the last four years. Among US adults with type I diabetes in 2020, those using CGM were younger on average than those using SMBG (43.0±1.07 vs.47.3±1.54; p=0.004). Similarly, when compared to all other adults with type I diabetes, those using CGM were more likely to be married/living with a partner (62.3% vs. 49.1%; p=0.012) and have a lower averageCharlson comorbidity index (CCI) (1.54±0.11 vs. 2.30±0.34; p=0.007).

CONCLUSIONS :
In a broadly representative US population of adults with type I diabetes, self-reported use of CGM increased from 33.9% to 51.2% from 2017 to 2020, becoming the preferred glucose test ormonitor. Comparisons of CGM users versus those using SMBG indicated a significant age gap.

REFERENCES

Didyuk O, Econom N, Guardia A, Livingston K, Klueh U. Continuous Glucose Monitoring Devices: Past, Present, and Future Focus on the History and Evolution of Technological Innovation. J Diabetes Sci Technol. 2021 May;15(3):676-683.

Statistical Analysis Software (SAS). [Computer software, version 9.4]. SAS Institute, Cary NC.