Clinical benefit of a diabetes management solution for HCPs: a cross sectional analysis across ES, UK, US and BR

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Background

537 million people lived with diabetes in 2021 according to IDF Atlas[1]
- 3 out of 4 live in low- and middle-income countries
- More than 6.7 million deaths directly attributed to diabetes every year
- Total healthcare expenditure due to diabetes was estimated to be around USD 966 billion

What to expect in the near future?
- By 2030, the number of people living with diabetes is expected to rise to 643 million (20% increase) and suppose a healthcare expenditure of USD 1,028 billion.
- By 2045, the number of people living with diabetes is expected to rise to 783 million (46% increase) and suppose a healthcare expenditure of USD 1,054 billion.

> To reduce the projected diabetes burden and offer more sustainable and personalized care, organizations need to address future challenges and technology needs now

Diabetes prevalence according to IDF atlas 2021. 51M in North America and Caribbean, 61M in Europe, 32M in South and Central America, 24M in Africa, 73M in Middle East and North Africa, 90M in South East Asia and 206M in Western Pacific

[1] International Diabetes Federation. IDF Diabetes Atlas, 10th edn. Brussels, Belgium: 2021. Available at: https://www.diabetesatlas.org

Understanding the challenges and needs from HCPs

To better understand the impact of a diabetes management software for healthcare professionals, an investigation around the usability and benefits of the RocheDiabetes Care Platform was run targeting different healthcare professionals backgrounds in different countries. The chosen countries were selected based on the number of people with diabetes as well as the use of digital tools and number of users. The countries participating had the following details:

- Brazil (BR) - 15.7 million people with diabetes (≈7.3% of the total brazilian population) and a healthcare expenditure of USD 42.9 billion.
- Spain (ES) - 5.1 million people with diabetes (≈10.7% of the total spanish population) and a total of USD 15.5 billion healthcare expenditure.
- United Kingdom (UK) - 3.9 million people with diabetes (≈6% of the total british population) and USD 23.4 billion of healthcare expenditure
- United States (US) - 37 million people with diabetes (≈11.6% of the total US population) in and a healthcare cost of USD 327 billion
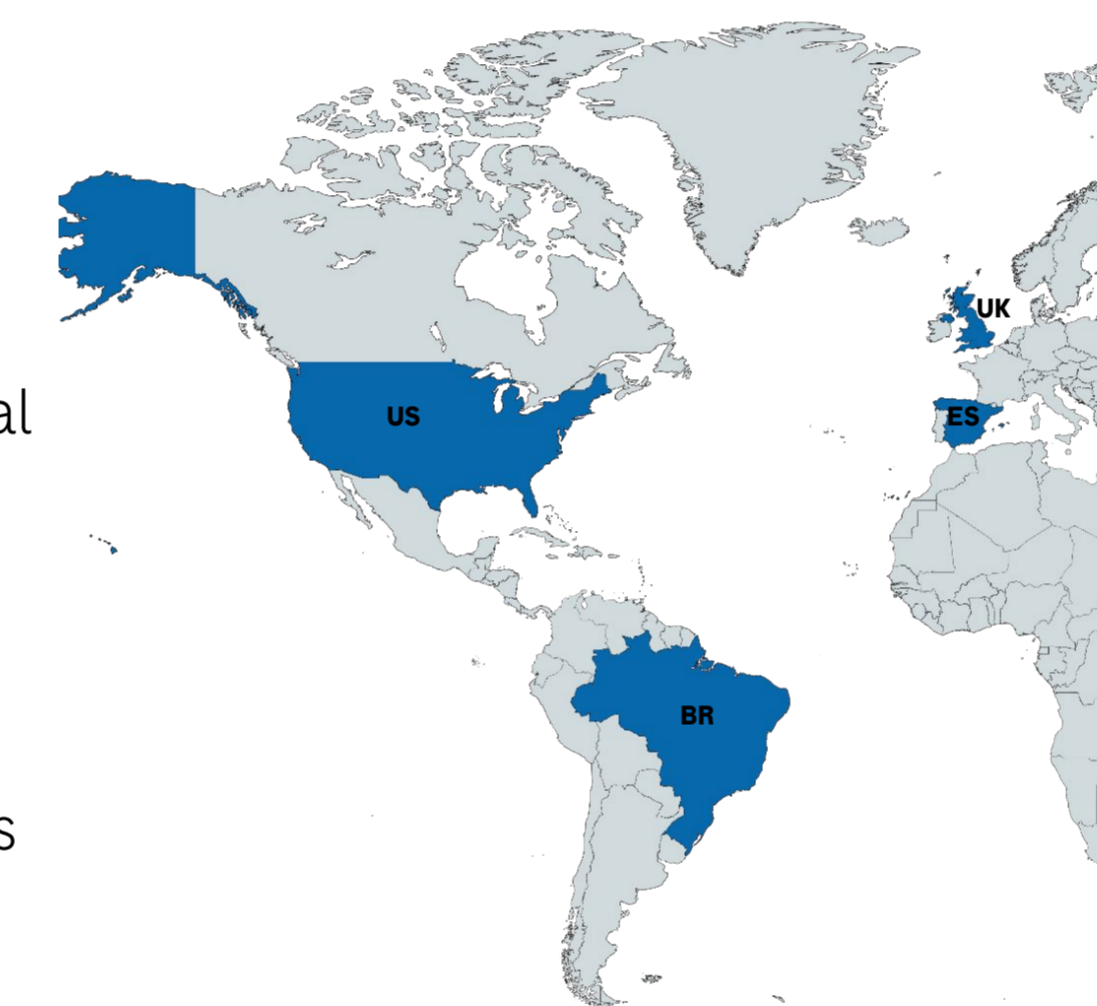
Design of the survey

A 9-question survey based on Likert scale was used to confirm the value of the following categories:
- Connectivity
- Visualization of the data
- Patient collaboration
- Glucose pattern analysis
- Therapeutic inertia
- Personalized care

The number of HCPs invited to participate was based on the one sample t-test considering a superiority mean of three (neutral Likert scale value) and assuming the actual mean of 3.4 and a standard deviation of 1.2 for each question in a finite population setting. The Bonferroni-Holm method[2], was used to adjust for multiple testing and to control the familywise error rate of 2.5% one-sided significance level.

The total sample size was 175 HCPs assuming a dropout of 15%. Different HCPs profiles were targeted in the different countries.

The HCPs were evenly distributed over the countries and the profiles were represented as general practitioners (GP) with 34%, nurses with 30%, endocrinologists with 21%, diabetologists with 11% and diabetes educators with 4%.
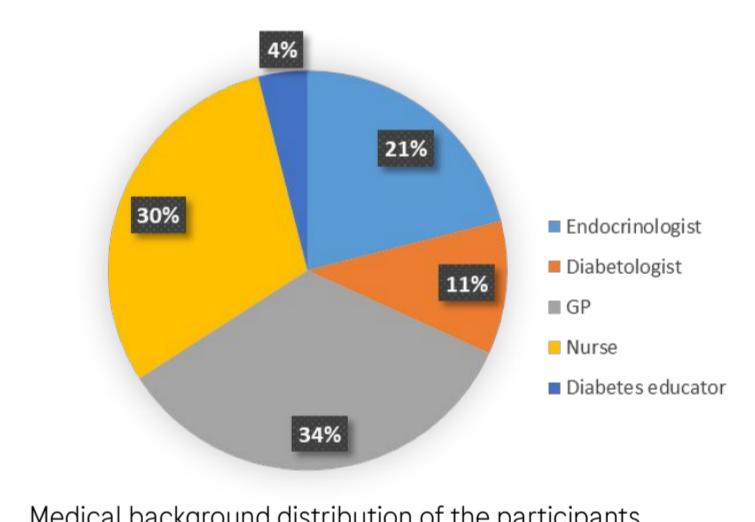
Medical background Distribution of the participants

Role	Brazil	Spain	UK	US	Total
Endocrinologist	10	10	3	14	37
Diabetologist	0	5	12	2	19
GP	15	15	15	15	60
Nurse	14	13	13	13	53
Diabetes educator	1	2	2	2	7
Total	40	45	45	46	176

Participants of the study
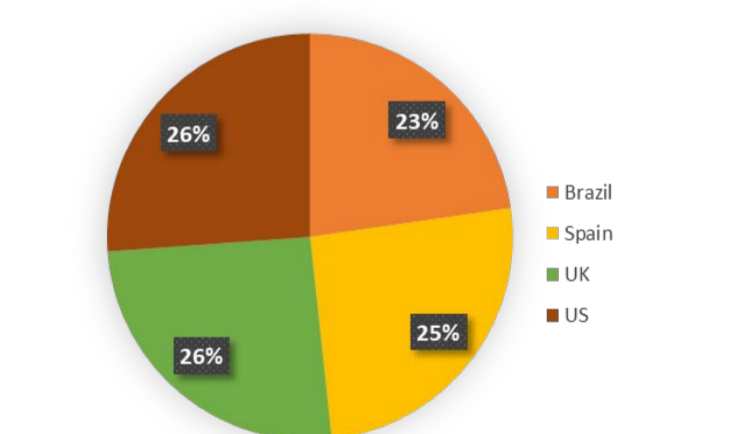
Country distribution of the participants

[2] Holm, Sture. 1979. Scandinavian Journal of Statistics 6 (2). [Board of the Foundation of the Scandinavian Journal of Statistics, Wiley]: 65–70. http://www.jstor.org/stable/4615733.

Results

The survey was run between December 2022 and January 2023 in 4 different countries and was translated in 3 different languages (english, spanish, brazilian).

The main findings were the following ones:
- The mean Likert score for each question was significantly higher than the neutral score of three*
- Brazil had the highest composite score with 4.42 ± 0.51 and US the lowest one with 4.02 ± 0.55 (mean ± SD)
- Deeper analysis on the data seems to indicate a difference in mean scores between the US and Brazil in the statement "I can spend less time gathering data and more time with my patient"
- Results do not seem to indicate notable differences between the medical backgrounds when it comes to the assessment of the advantages

	Overall		By country				by Medical background				
	Mean ± SD	p-value	Brazil	Spain	UK	US	Endocrinologist	Diabetologist	GP	Nurse	Diabetes educator
1. I can quickly and easily analyze the patients diabetes-related data	4.28 ± 0.70	<0.0001*	4.40 ± 0.70	4.30 ± 0.60	4.30 ± 0.70	4.10 ± 0.90	4.40 ± 0.70	4.60 ± 0.50	4.20 ± 0.60	4.20 ± 0.80	4.60 ± 0.50
2. I can enhance collaboration with the patients using the simple reports	4.20 ± 0.70	<0.0001*	4.40 ± 0.70	4.20 ± 0.60	4.20 ± 0.70	4.00 ± 0.70	4.10 ± 0.70	4.30 ± 0.50	4.10 ± 0.60	4.20 ± 0.70	4.60 ± 0.50
3. I can quickly analyze glucose control over time with the pattern management process	4.23 ± 0.70	<0.0001*	4.40 ± 0.60	4.30 ± 0.60	4.20 ± 0.80	4.00 ± 0.70	4.10 ± 0.70	4.40 ± 0.60	4.20 ± 0.70	4.30 ± 0.60	4.60 ± 0.50
4. I can make timely therapy adjustments	4.20 ± 0.70	<0.0001*	4.50 ± 0.60	4.10 ± 0.60	4.20 ± 0.70	4.00 ± 0.90	4.20 ± 0.80	4.20 ± 0.80	4.10 ± 0.70	4.30 ± 0.60	4.30 ± 0.80
5. I can spend less time gathering data and more time with my patient	4.15 ± 0.90	<0.0001*	4.50 ± 0.70	4.10 ± 0.60	4.20 ± 0.70	3.80 ± 1.10	4.30 ± 1.00	4.00 ± 0.90	4.20 ± 0.80	4.20 ± 0.80	4.30 ± 0.50
6. I can quickly and easily get an overview of the patient's diabetes related information	4.22 ± 0.70	<0.0001*	4.50 ± 0.70	4.20 ± 0.40	4.10 ± 0.70	4.00 ± 0.80	4.30 ± 1.00	4.20 ± 0.40	4.20 ± 0.70	4.20 ± 0.70	4.40 ± 0.50
7. I can better manage my diabetic patients using the different dashboards	4.12 ± 0.70	<0.0001*	4.40 ± 0.70	4.00 ± 0.70	4.10 ± 0.70	4.00 ± 0.70	3.90 ± 0.80	4.10 ± 0.70	4.20 ± 0.70	4.20 ± 0.70	4.40 ± 0.50
8. I am satisfied with the visualization of the diabetes related data	4.07 ± 0.70	<0.0001*	4.40 ± 0.70	4.00 ± 0.70	4.20 ± 0.80	4.00 ± 0.60	3.80 ± 0.70	4.30 ± 0.70	4.10 ± 0.70	4.10 ± 0.70	4.10 ± 0.70
9. The platform allows me to deliver more personalized care	4.23 ± 0.70	<0.0001*	4.40 ± 0.60	4.30 ± 0.70	4.10 ± 0.60	4.10 ± 0.70	4.20 ± 0.70	4.30 ± 0.70	4.10 ± 0.70	4.30 ± 0.70	4.30 ± 0.50

* p-values of the one-sided one-sample t-test, including the finite population correction for the standard error[3], were calculated and sorted in ascending order to apply Bonferroni-Holm adjustment based
[3] Bondy, Warren H., and William Zlot. 1976. The American Statistician 30 (2). Taylor & Francis: 96–97. doi:10.1080/00031305.1976.10479149
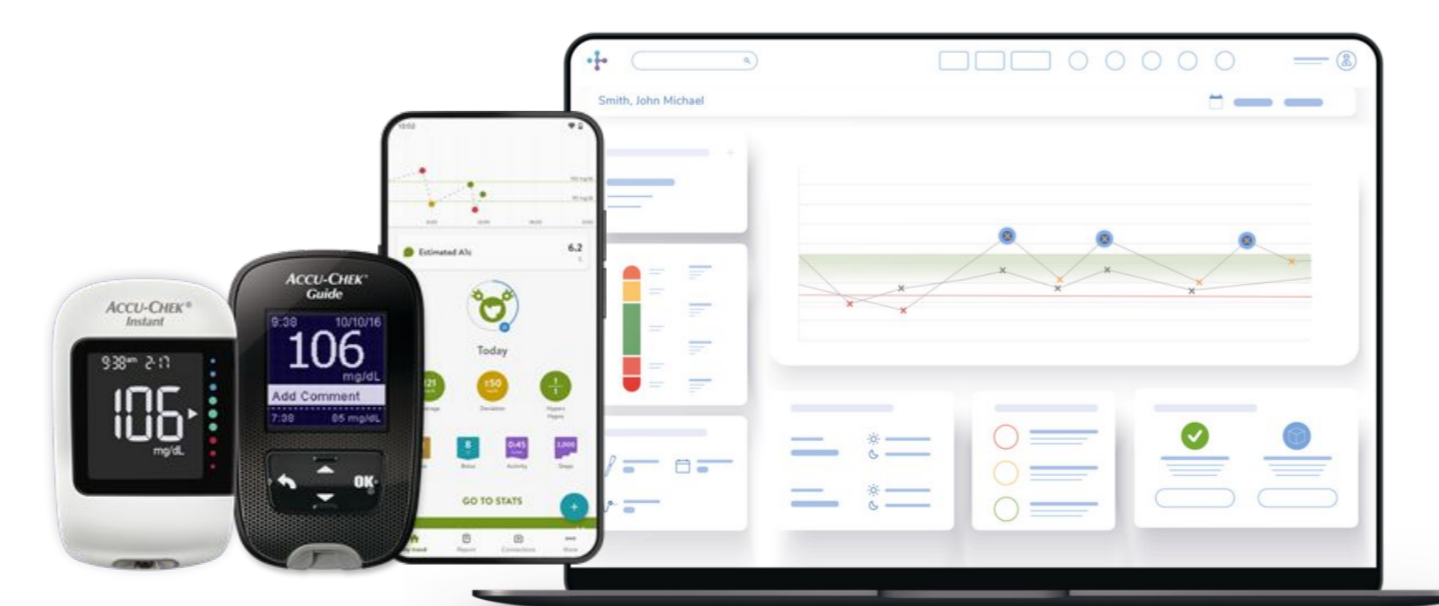
Conclusions

The results of this study based on the Likert scale and run with 176 HCPs proved superiority in the mean scores for all the questions tested. This confirms that the digital product evaluated, RocheDiabetes Care Platform, provides value to the users when managing PwD.

Deeping more into the data, there seems to be no differences between the targeted countries even though Brazil had the highest composite score with 4.42 ± 0.51 and US the lowest one with 4.02 ± 0.55 (mean ± SD).

Regarding the HCP profiles, results do not seem to indicate notable differences when it comes to the assessment of the advantages.

This demonstrates that, in a more digitized medical environment, data analysis, visualization and pattern detection are a key component for treating persons with diabetes, irrespective of culture and health care setting.

Acknowledgements