
Diabeter

Technology is more than the device:
sustainable improvement of glycaemic control in type 1 diabetes through data-driven eHealth including patient-HCP contacts

Dick Mul, Henk-Jan Aanstoot, Pim Dekker, Martine de Vries, Theo Sas, Henk Veeze

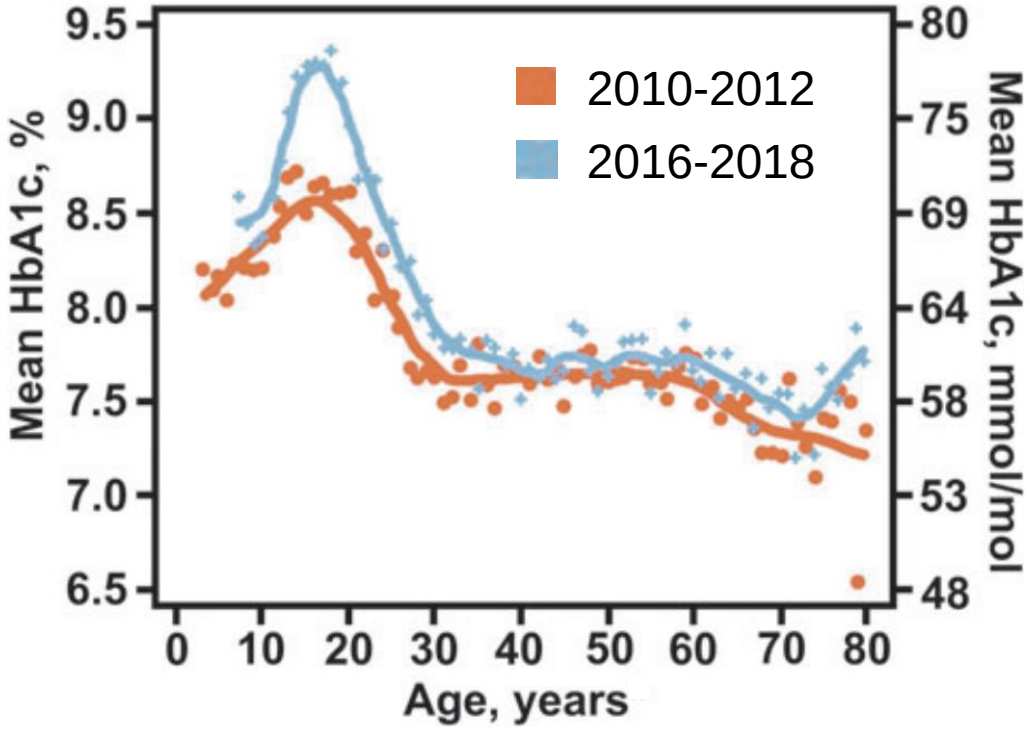
Diabeter, Rotterdam, The Netherlands.

Disclosures

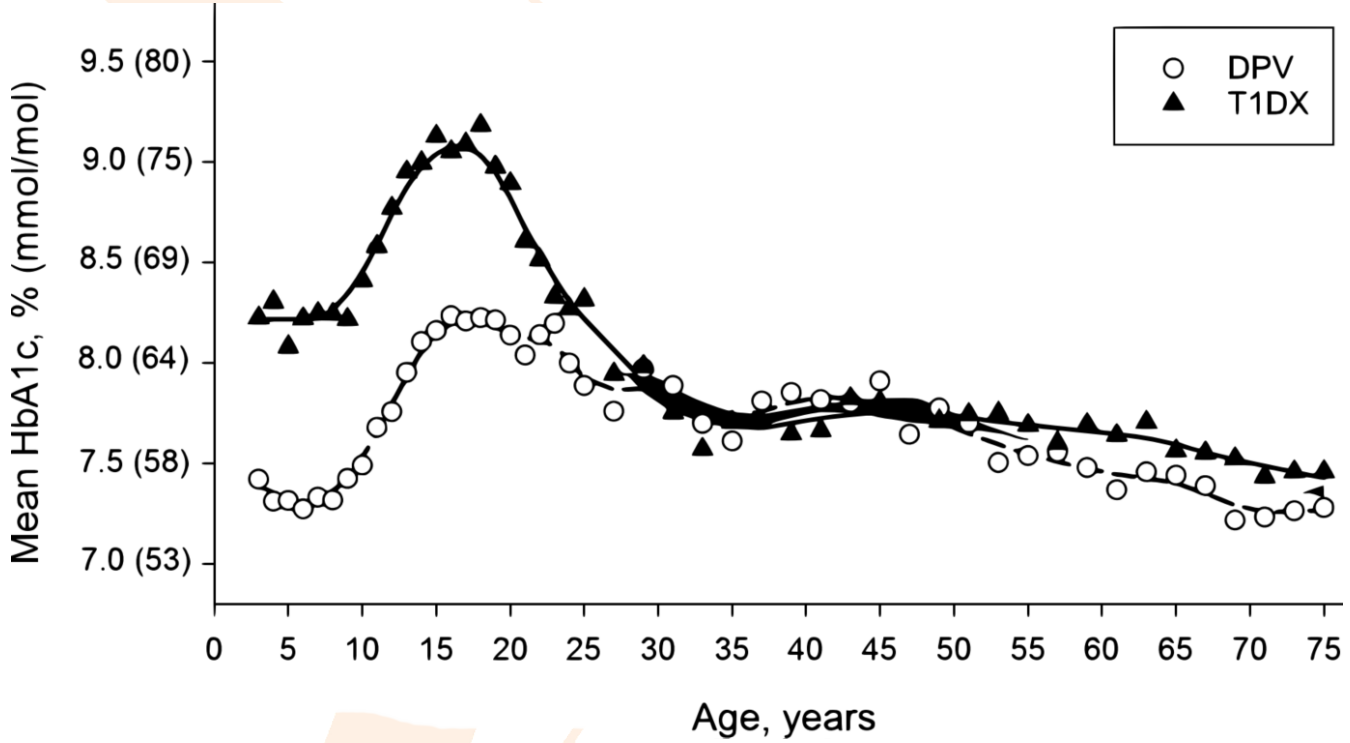
- Healthcare contracts with all Dutch insurance organizations
- Diabeter was acquired by Medtronic in April 2015. Diabeter is compliant with legal and healthcare policies and laws on independency for prescription, patient data, research and employee data
- Institutional research funding: JDRF
- In the context of this presentation there are no conflicts of interest

Background

- Despite increased use of diabetes technology, glycemic control worsened from 2010-2012 to 2016/2018 in the USA[1]:

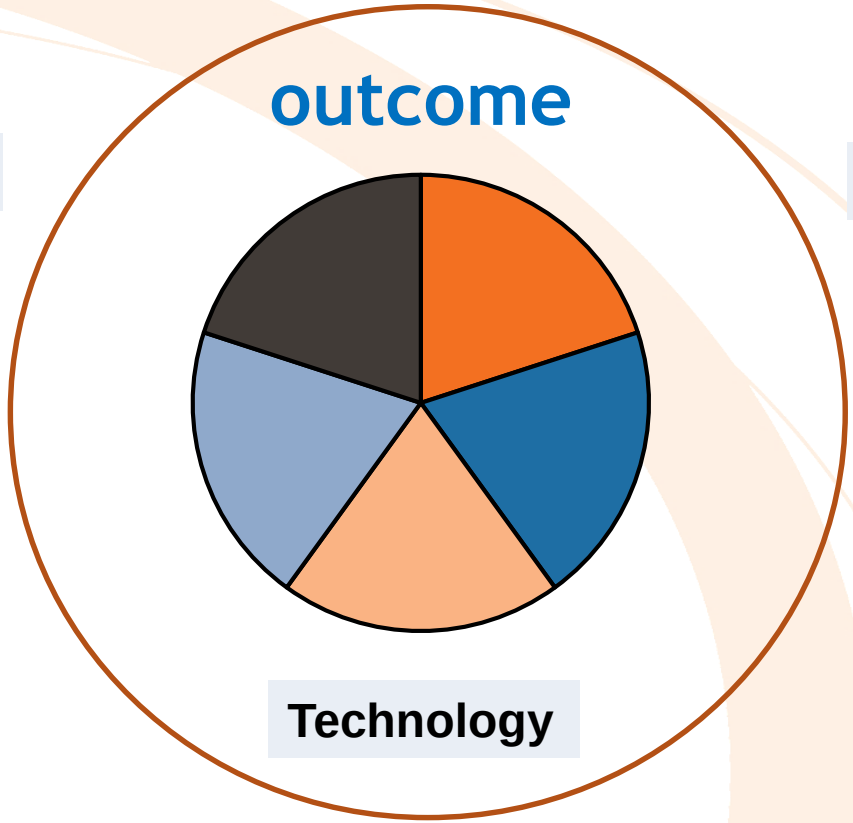


- "*Transatlantic gap*": discrepancy in glycemic control between developed Western countries (up to 1% HbA1c)[2]:



[1]Foster et al., Diabetes Technol Ther. 2019 Feb;21(2):66-72.
[2]Hermann et al., Diabet Med. 2019 Sep 26. doi: 10.1111/dme.14148. [Epub ahead of print]

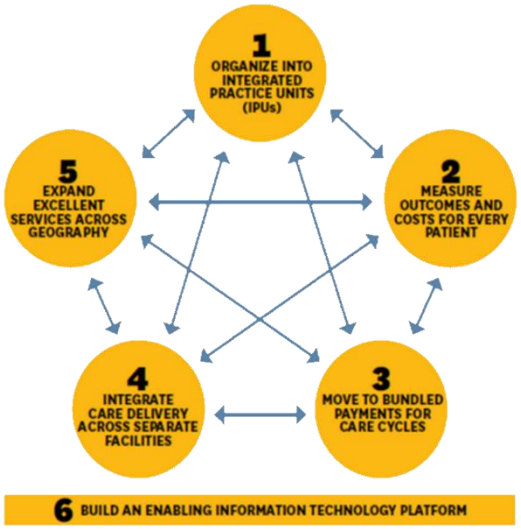
Outcome of care



Aim: compare outcome in relation to use of technology between US registry and single center

[1]Cameron et al., Ped Diabetes 2013:Lessons from the Hvidoere International Study Group on childhood diabetes: be dogmati about outcome and flexible in approach b;21(2):66-72.

Diabeter: Value-based health care model



Key elements VBHC

- Focused and personalized T1DM care
- Children, adolescents and young adults
- eHealth supporting
  - frequent contacts + feedback
  - uploads glucose data (SMBG, pump, CGM)
  - data driven improvement of care
- The Diabeter model is proven to drive improved T1D patient outcomes and team efficiency

Study design

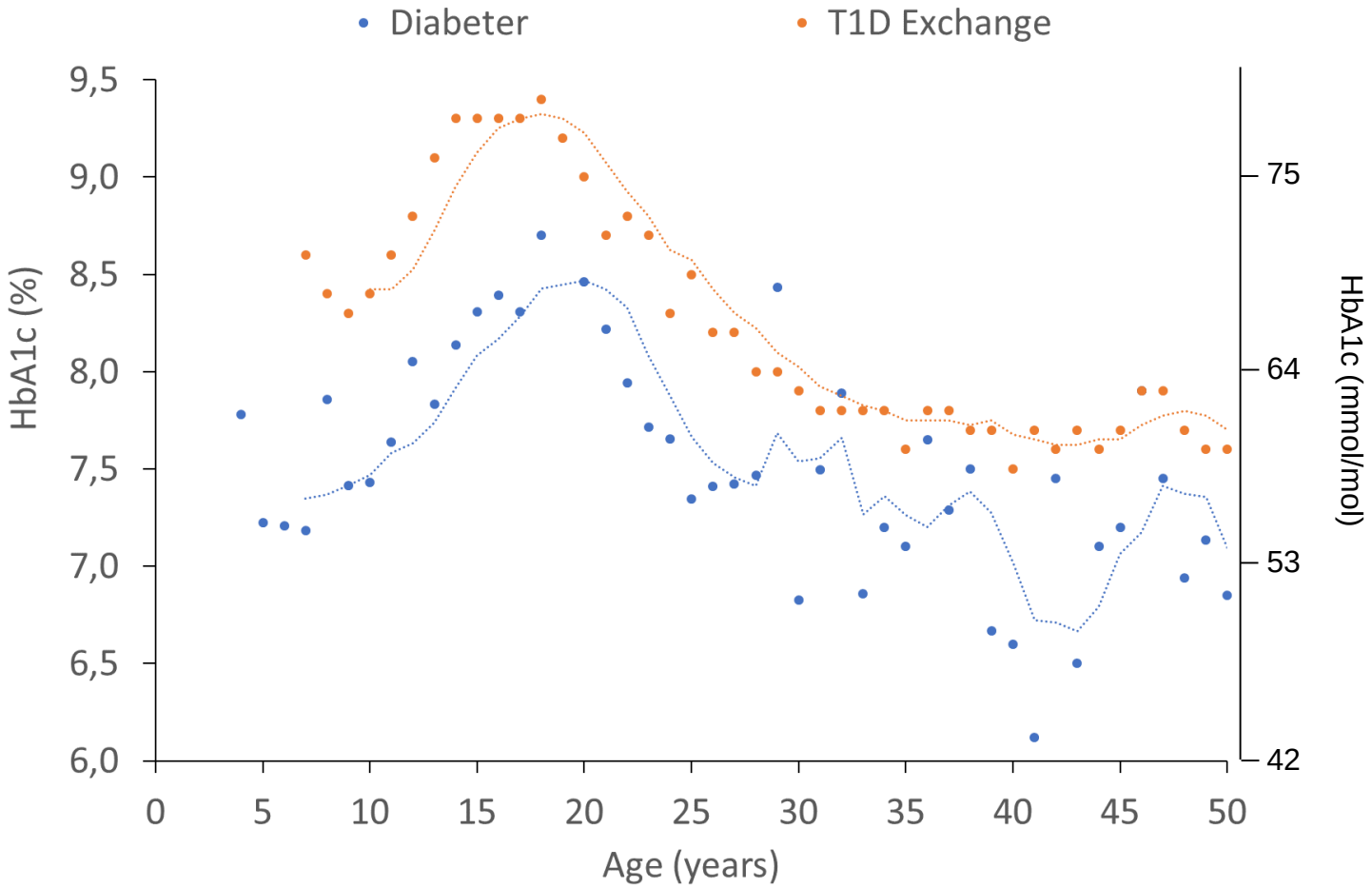
- Disease management system Vcare: patient's SMBG, pump and CGM data
- Cross-sectional data 2018: treatment modality (MDI/pump), uploads, glucose monitoring methods (SMBG/FGM/CGM) and as outcome parameters HbA1c (last value of year) and in-house developed individual *Net Improvement score* (NIS) .
- NIS: to express the overall glycemic improvement in care/outcome between 2017 and 2018:

- Data were analysed descriptively and compared with the T1D Exchange data (2016-2018).

CGM, continuous blood glucose monitoring; FGM, flash glucose monitoring; MDI, multiple daily injections; SMBG, self-monitored blood glucose

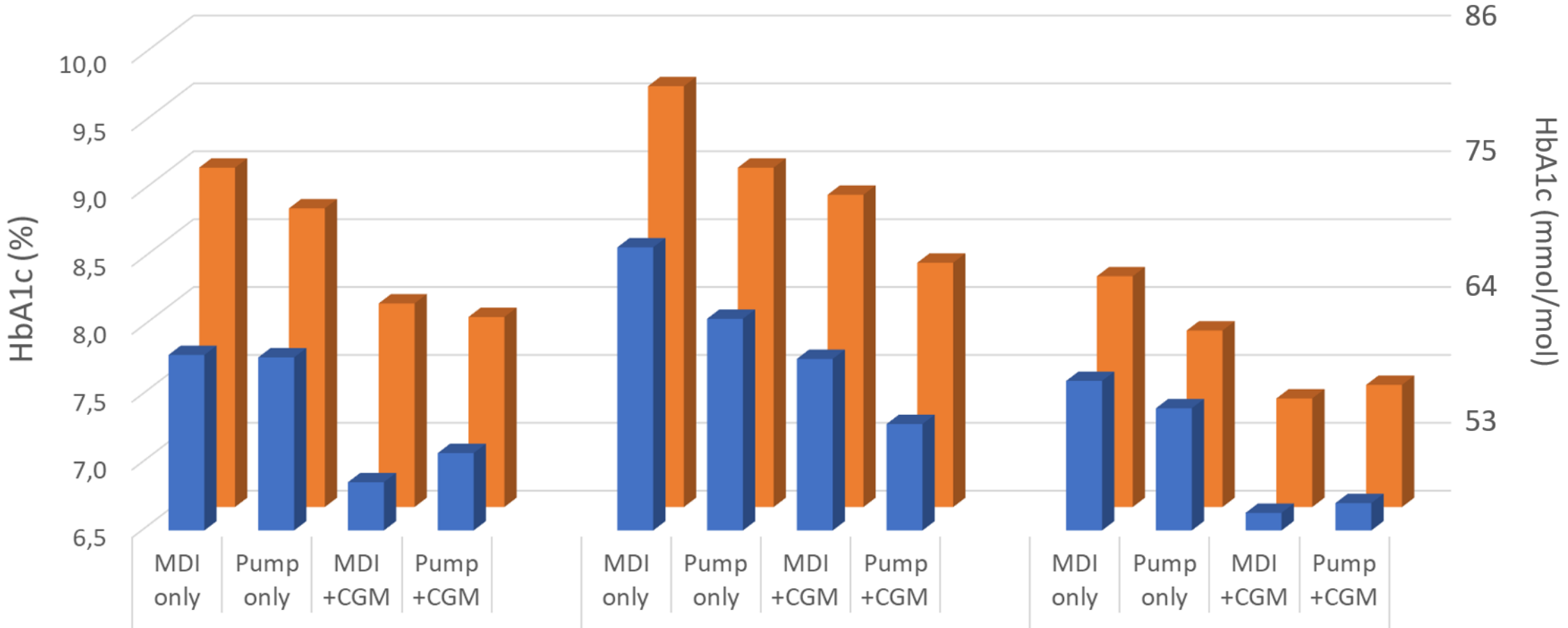
Results (1): Patient characteristics

	Diabeter 2018	T1D Exchange[1] 2016-2018
N	2,035	22,697
Age, in years (SD)	20 (9)	26 (18)
HbA1c, in % (SD)	7,9 (1,6)	8,4*
HbA1c, in mmol/mol (SD)	63 (17)	68*
Pump use, in %	57	63
CGM use, in %	17	30
Patients who uploaded data, in %	88	40



[1]Foster et al., Diabetes Technol Ther. 2019 Feb;21(2):66-72.
* Standard deviation not available from reference

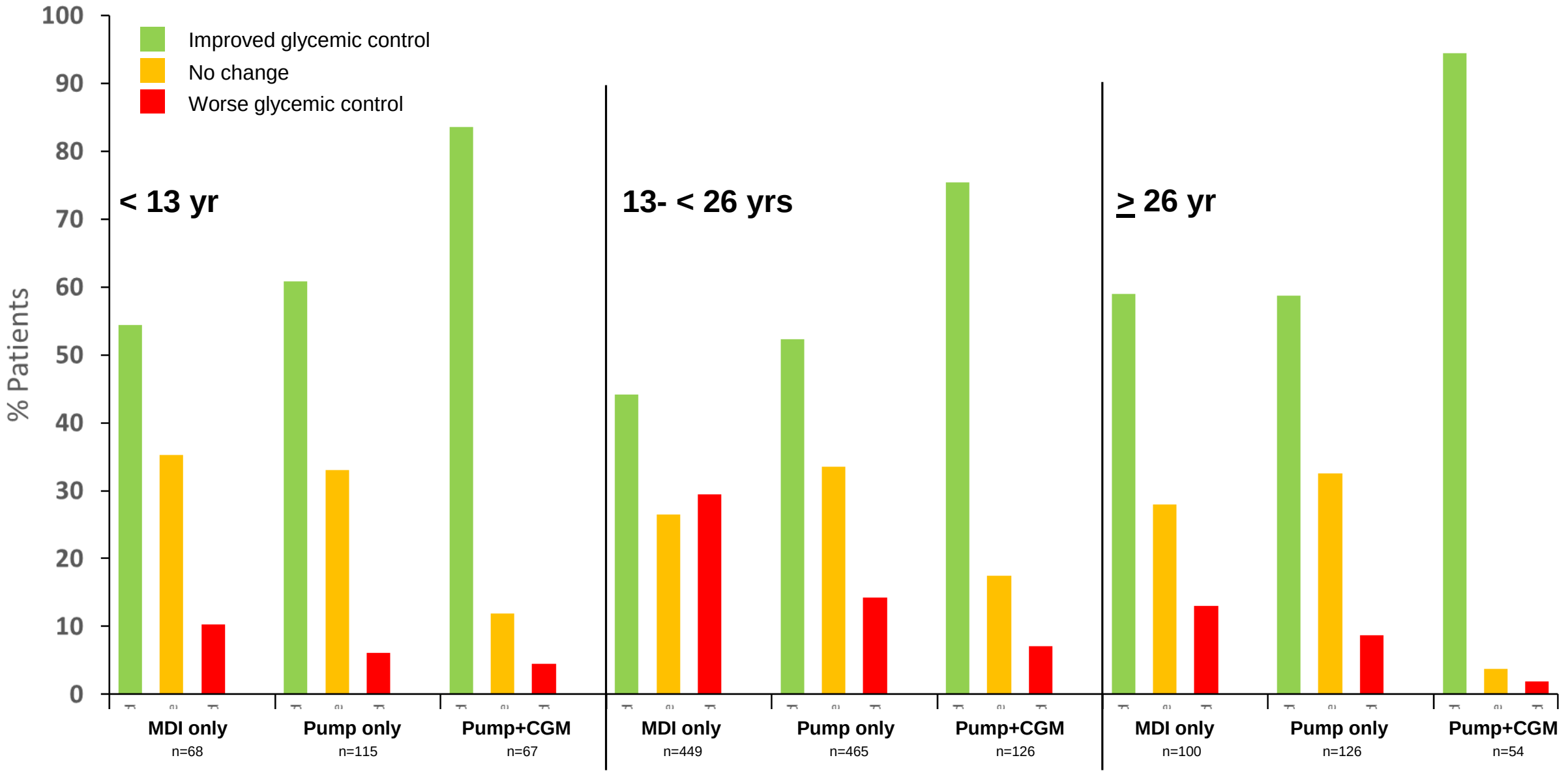
Results (2): Pump/CGM use



	<13 years				total	13 - <26 years				total	≥26 years				total
Diabeter A1C, %	7,8	7,8	6,9	7,1	7,6	8,6	8,1	7,8	7,3	8,2	7,6	7,4	6,6	6,7	7,3
mmol/mol	62	61	51	54	60	70	65	61	56	66	60	57	49	50	56
n	148	131	9	87	375	577	569	11	157	1314	125	143	10	68	346
T1D Exchange A1C, %	9.0	8.7	8.0	7.9	8.4	9.6	9.0	8.8	8.3	8.9	8.2	7.8	7.3	7.4	7.7
mmol/mol	75	72	64	63	68	81	75	73	67	74	66	62	56	57	61
n					3,653					10,468					6,407

CGM, continuous blood glucose monitoring; MDI, multiple daily injections; N/A, not available

Results (3): Net Improvement Score Diabeter

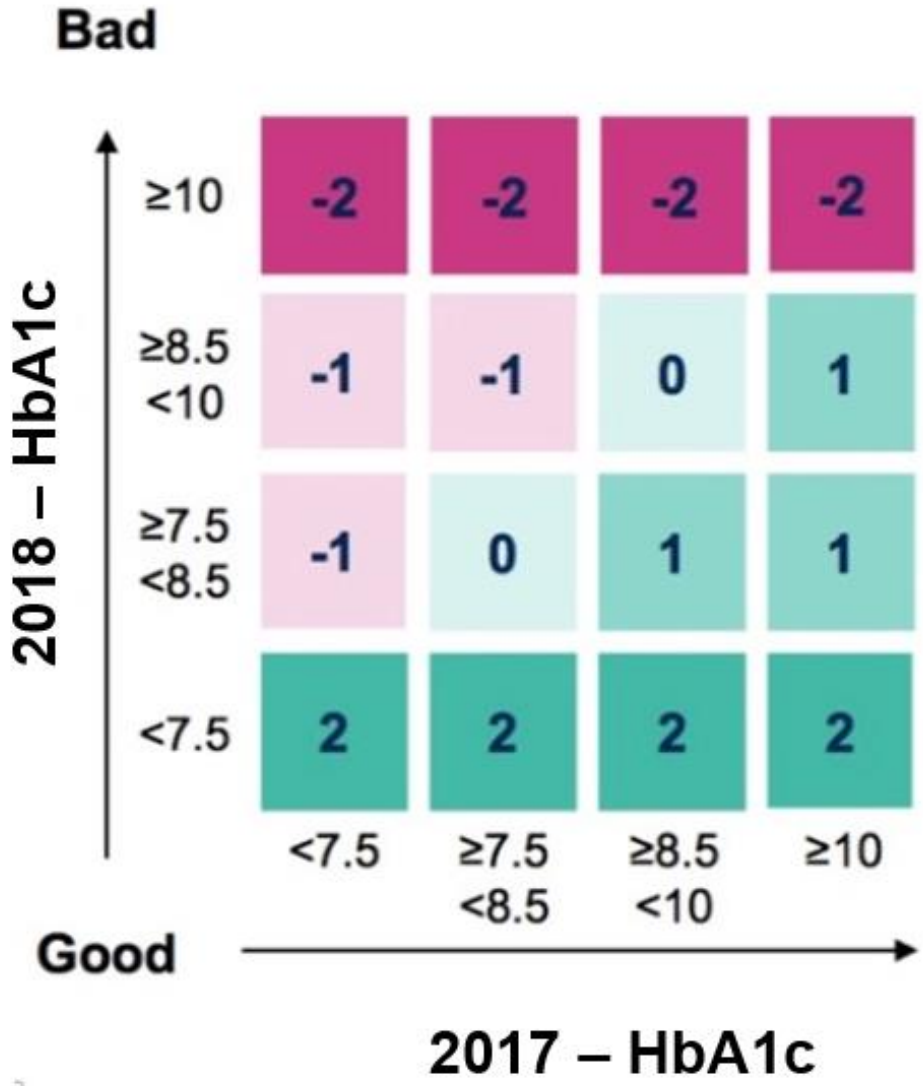


% patients with improved glycemic control, no change or worsened glycemic control calculated per category per age group

Conclusion & discussion

- Comparison between T1D Exchange and Diabeter:
  - comparable patterns of glycemic control in subgroups
  - despite higher technology use no better outcomes in T1D Exchange
- In Diabeter's VBHC model (combining use of technology with frequent uploads and contacts between patient and team):
  - improvement in outcome 2017 --> 2018 with all treatment modalities
  - trend for more inprovement with more technology
- Technology matters, but needs integration in care program: it is more than the device

Thank you!


Bad
2018 – HbA1c
≥10
≥8.5 <10
≥7.5 <8.5
<7.5
-2
-2
-2
-2
-1
-1
0
1
-1
0
1
1
2
2
2
2
<7.5
≥7.5 <8.5
≥8.5 <10
≥10
Good
2017 – HbA1c