Stanford MEDICINE

International Comparisons in Diabetes Outcomes: Lessons from Abroad

Type 1 Diabetes Exchange 2023 National Meeting

November 15, 2023

David Maahs, MD, PhD Professor of Pediatrics

Stanford Children's Health | Lucile Packard Children's Hospital Stanford

Stanford Diabetes Research Center

Session Objective:

- At the end of this session, members will be able to identify and summarize health conditions for diabetes populations in Europe, Australia, and the UK.

Outline

- Where are we now?
- What opportunities exist for future collaboration?
- Overview of selected past papers.
- What to do if you are interested?

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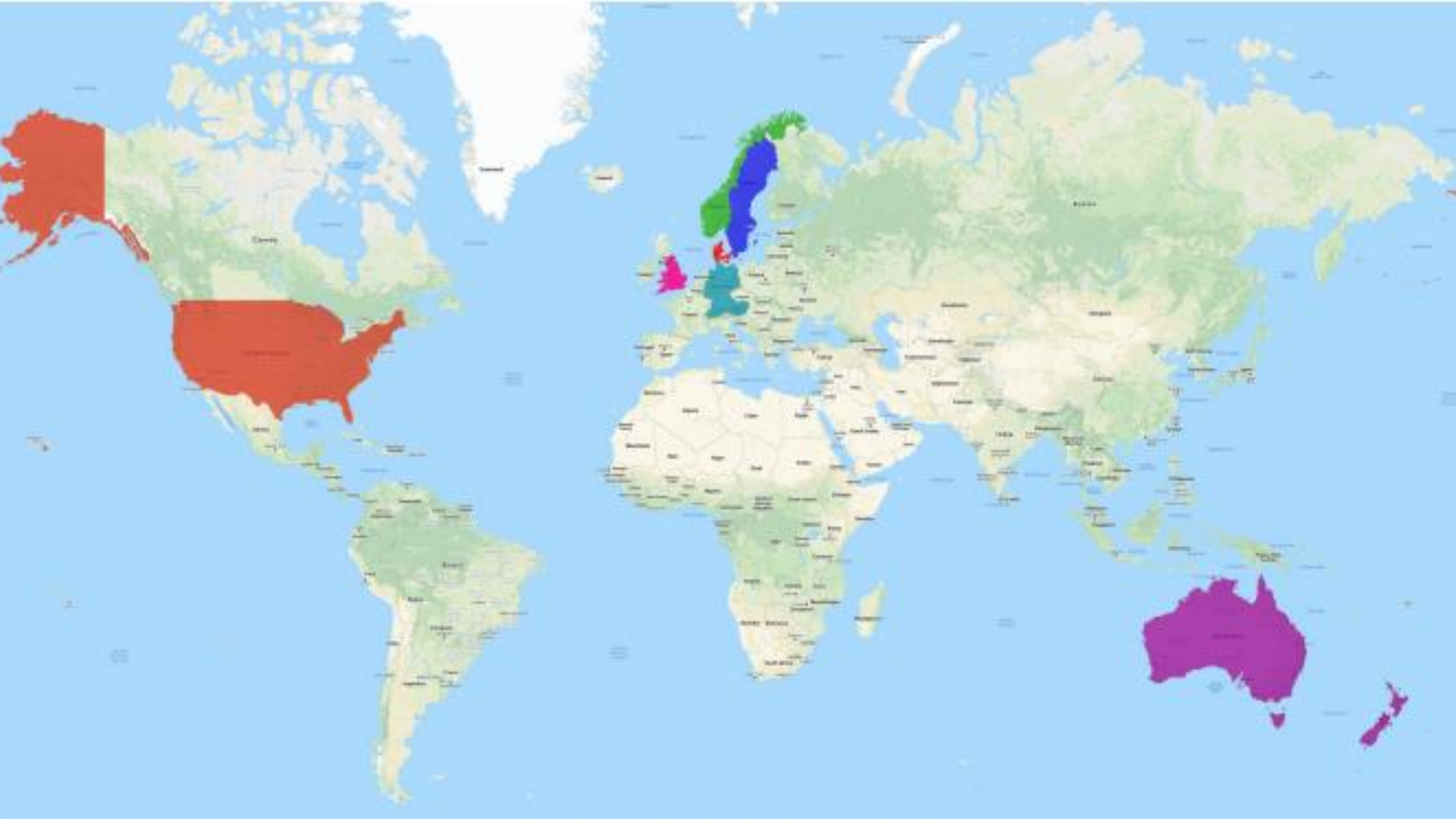
DOI: 10.1111/pedi.13362

EPIDEMIOLOGY

ISPAD WILEY

A collaborative comparison of international pediatric diabetes registries

Stefanie Lanzinger[1,2] | Anthony Zimmermann[3] | Ajenthen G. Ranjan[4,5] | Osman Gani[6,7] | Saira Pons Perez[8] | Karin Akesson[9,10] | Shideh Majidi[11] | Michael Witsch[12] | Sabine Hofer[13] | Stephanie Johnson[14] | Kasper A. Pilgaard[15,16] | Siv Janne Kummernes[6,7] | Holly Robinson[8] | Katarina Eeg-Olofsson[17,18] | Osagie Ebekozien[19,20] | Reinhard W. Holl[1,2] | Jannet Svensson[15,16] | Torild Skrivarhaug[21,22] | Justin Warner[23] | Maria E. Craig[24,25,26] | David Maahs[27,28] | Australasian Diabetes Data Network (ADDN), Danish Registry of Childhood and Adolescent Diabetes (DanDiabKids), Diabetes prospective follow-up registry (DPV), Norwegian Childhood Diabetes Registry (NCDR), National Paediatric Diabetes Audit (NPDA), Swedish Childhood Diabetes Registry (Swediabkids), T1D Exchange Quality Improvement Collaborative (T1DX-QI), and SWEET initiative



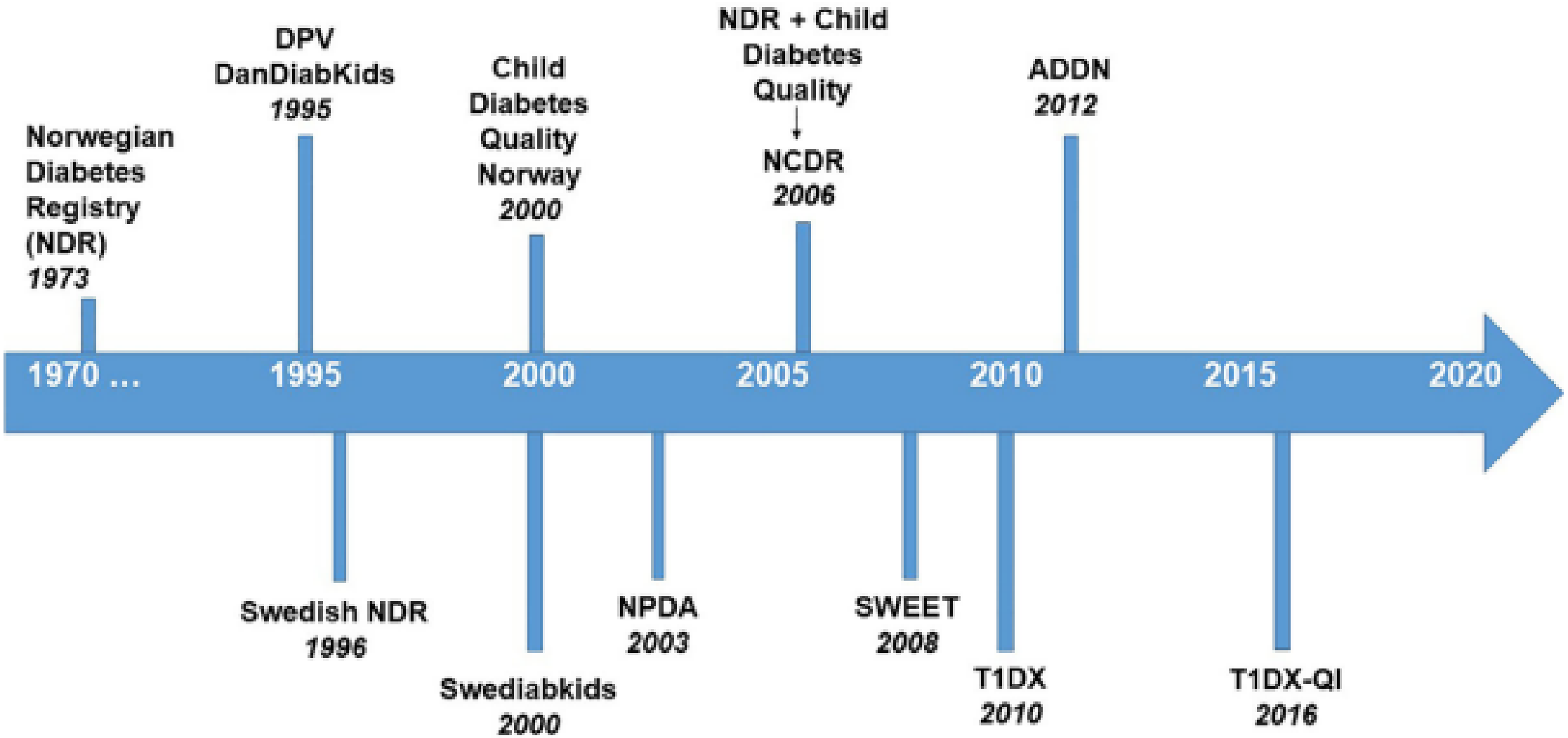


FIGURE 3 Timeline foundation of participating registries

Key Questions

- Do the data exist?
- Can we harmonize/compare the data?
- How can we share the data and perform the analysis?
- Authorship?
- Do we need funding or biostatistical support?
- What are the hypotheses?
- Is it novel?
- How would it advance the field?

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Diabetologia (2014) 57:1578–1585
DOI 10.1007/s00125-014-3272-2

ARTICLE

Contrasting the clinical care and outcomes of 2,622 children with type 1 diabetes less than 6 years of age in the United States T1D Exchange and German/Austrian DPV registries

David M. Maahs · Julia M. Hermann · Stephanie N. DuBose · Kellee M. Miller · Bettina Heidtmann · Linda A. DiMeglio · Birgit Rami-Merhar · Roy W. Beck · Edith Schober · William V. Tamborlane · Thomas M. Kapellen · Reinhard W. Holl · for the DPV Initiative and the T1D Exchange Clinic Network

A1c 7.4% DPV
8.2% in T1DX
p<0.001

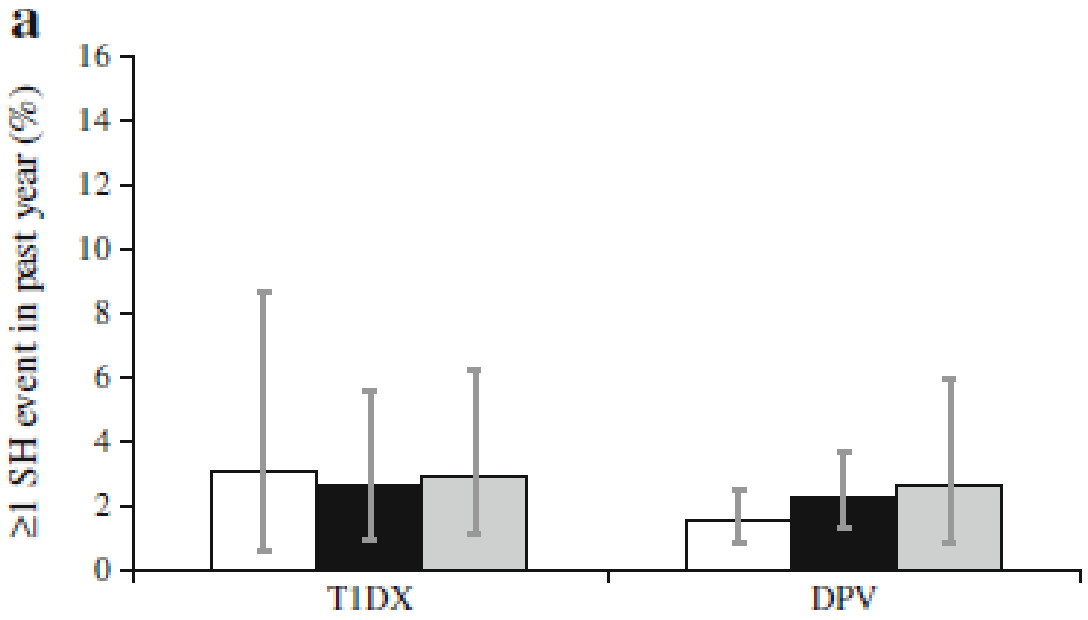
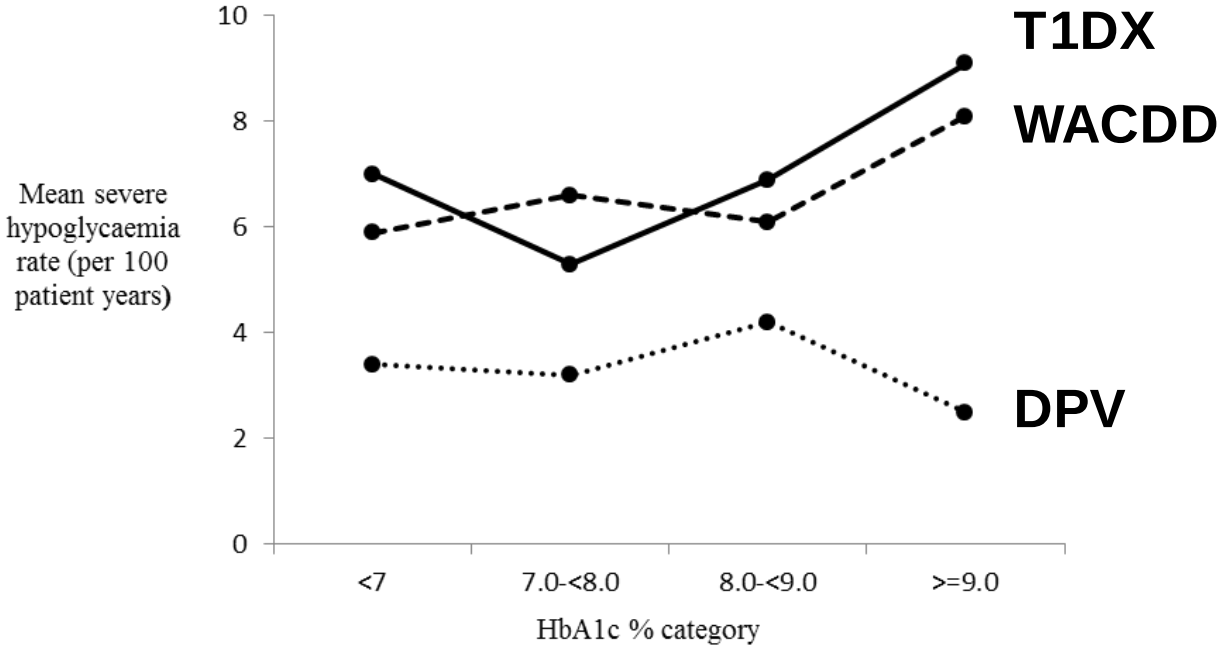
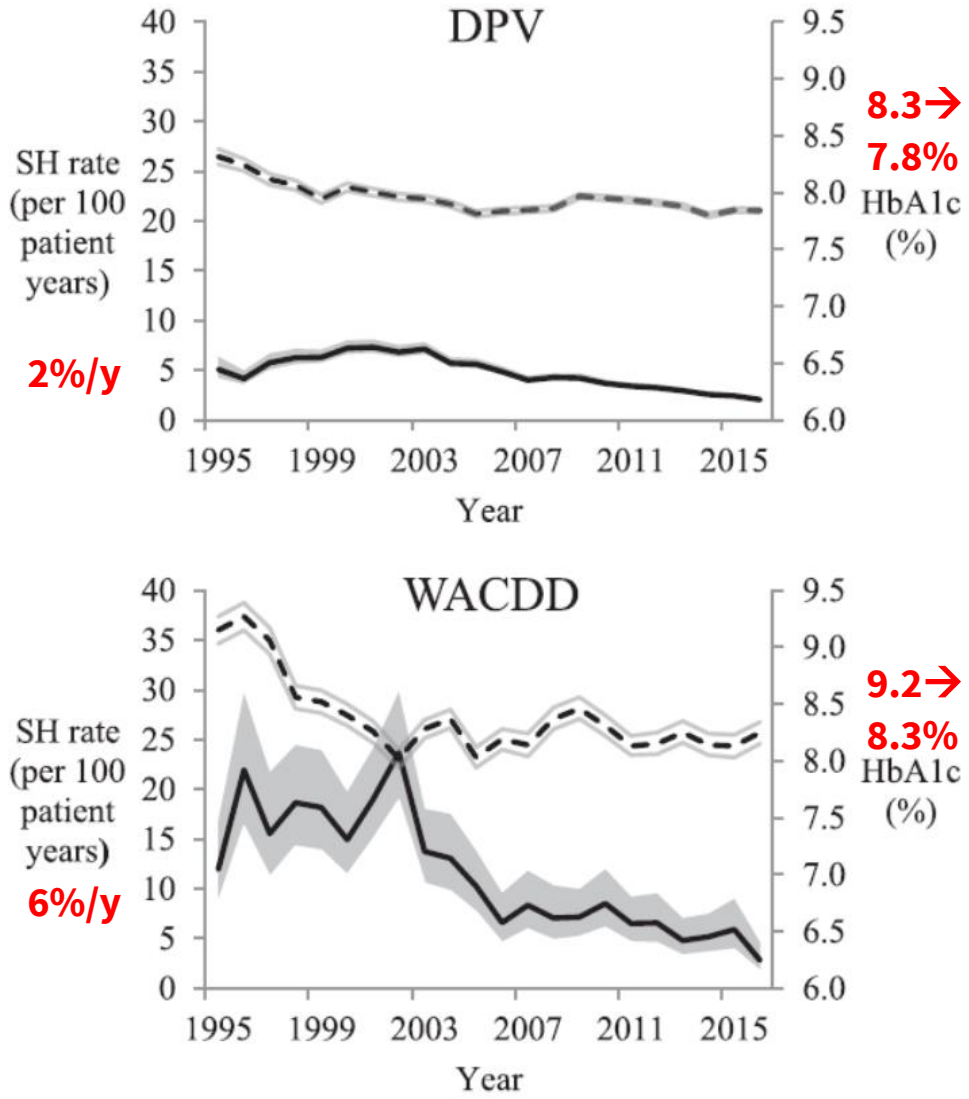


Fig. 3 (a) Percentage with ≥1 SH event in past year by HbA_{1c}. (b) Percentage with ≥1 DKA event in past year by HbA_{1c}. White bars, mean HbA_{1c} <7.5% (<58 mmol/l); black bars, mean HbA_{1c} 7.5 to <8.5% (58 to <69 mmol/l); grey bars, mean HbA_{1c} ≥8.5% (≥69 mmol/l). **p=0.004; ***p<0.001; p values unadjusted and testing whether the frequency of SH/DKA differs by HbA_{1c} group, within each registry

SH/100 pt yrs by 1) HbA1c & 2) registry x 20 years



Haynes, Miller, et al, PDiab '16

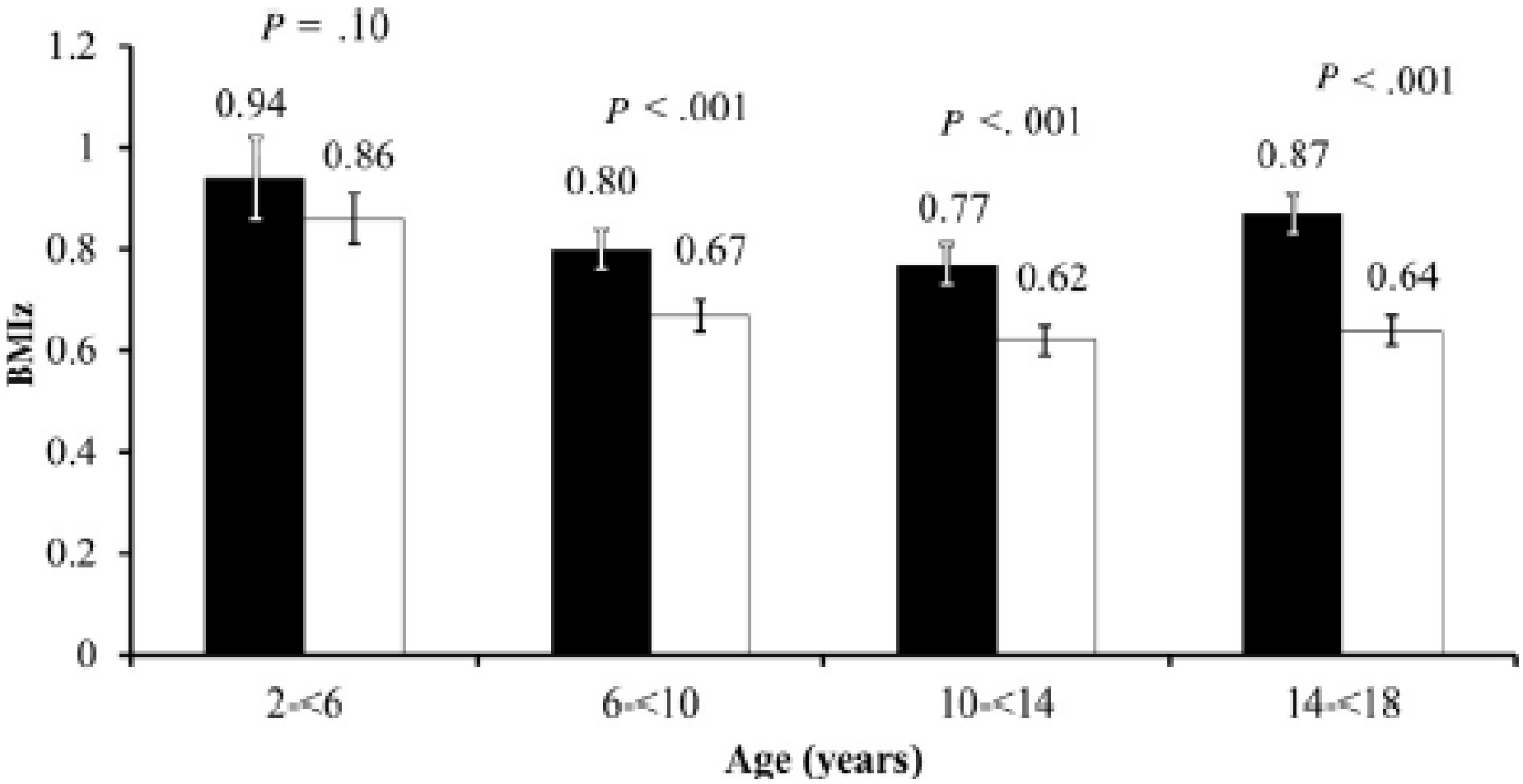


Haynes, Diabetes Care '19

Mean & 95% CI BMIz (Compared to WHO norms)

SEARCH,
22.1%
Overweight
12.6%
Obese
Liu, PDiab, '10

Australia:
BMI SD Score
0.47 to 0.82 SD
over 10 years
Downie, DC '11



T1DX Black Bars/DPV White Bars; Dubose, *JPeds*, '15

Diabetes Care Volume 40, October 2017

Use of Adjuvant Pharmacotherapy in Type 1 Diabetes: International Comparison of 49,996 Individuals in the Prospective Diabetes Follow-up and T1D Exchange Registries

Diabetes Care 2017;40:e139–e140 | https://doi.org/10.2337/dc17-0403

Sarah K. Lyons,[1] Julia M. Hermann,[2,3] Kellee M. Miller,[4] Sabine E. Hofer,[5] Nicole C. Foster,[4] Birgit M. Rami-Merhar,[6] Grazia Aleppo,[7] Jochen Seufert,[8] Linda A. DiMeglio,[9] Thomas Danne,[10] David M. Maahs,[11] and Reinhard W. Holl[2,3]

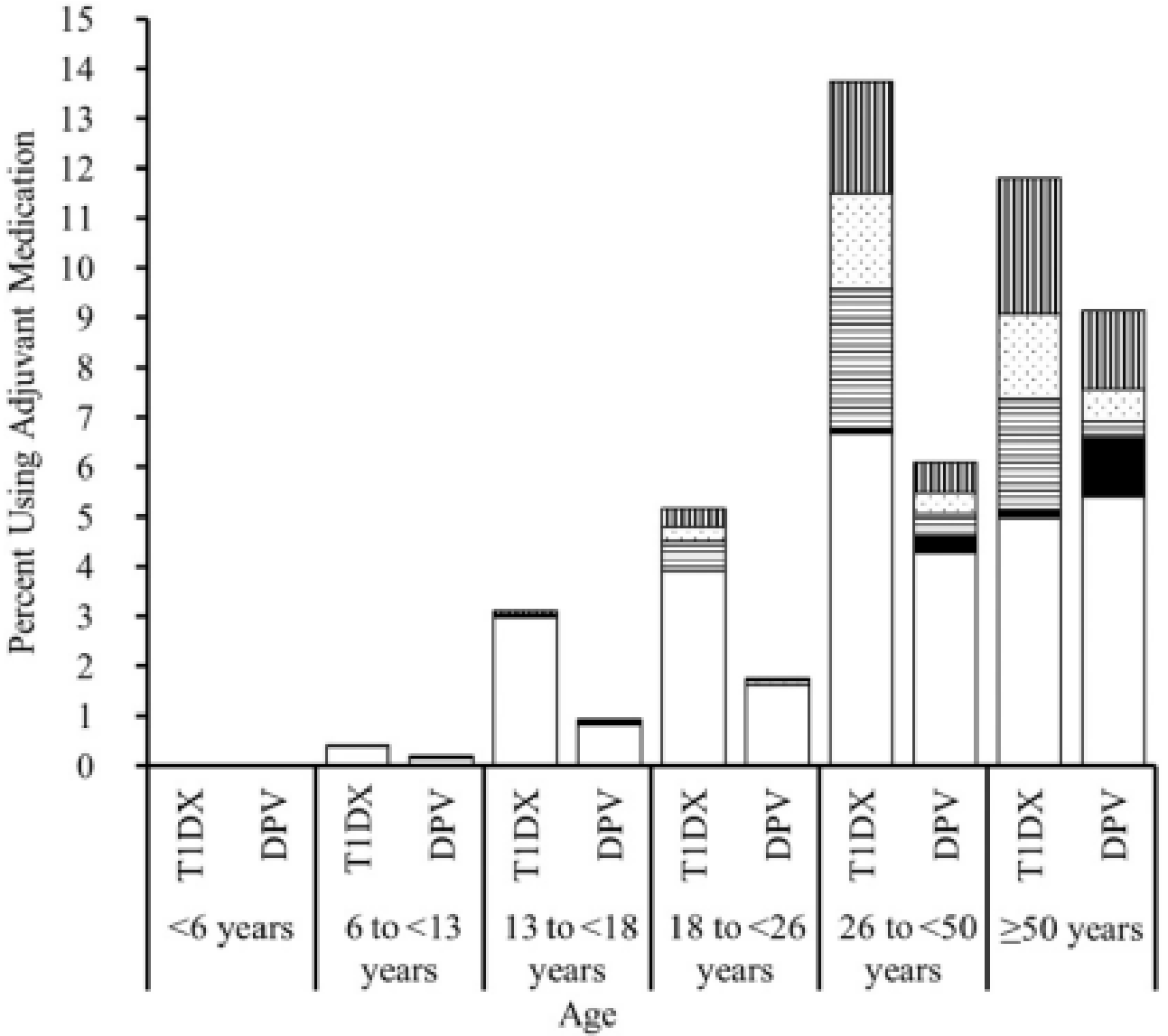


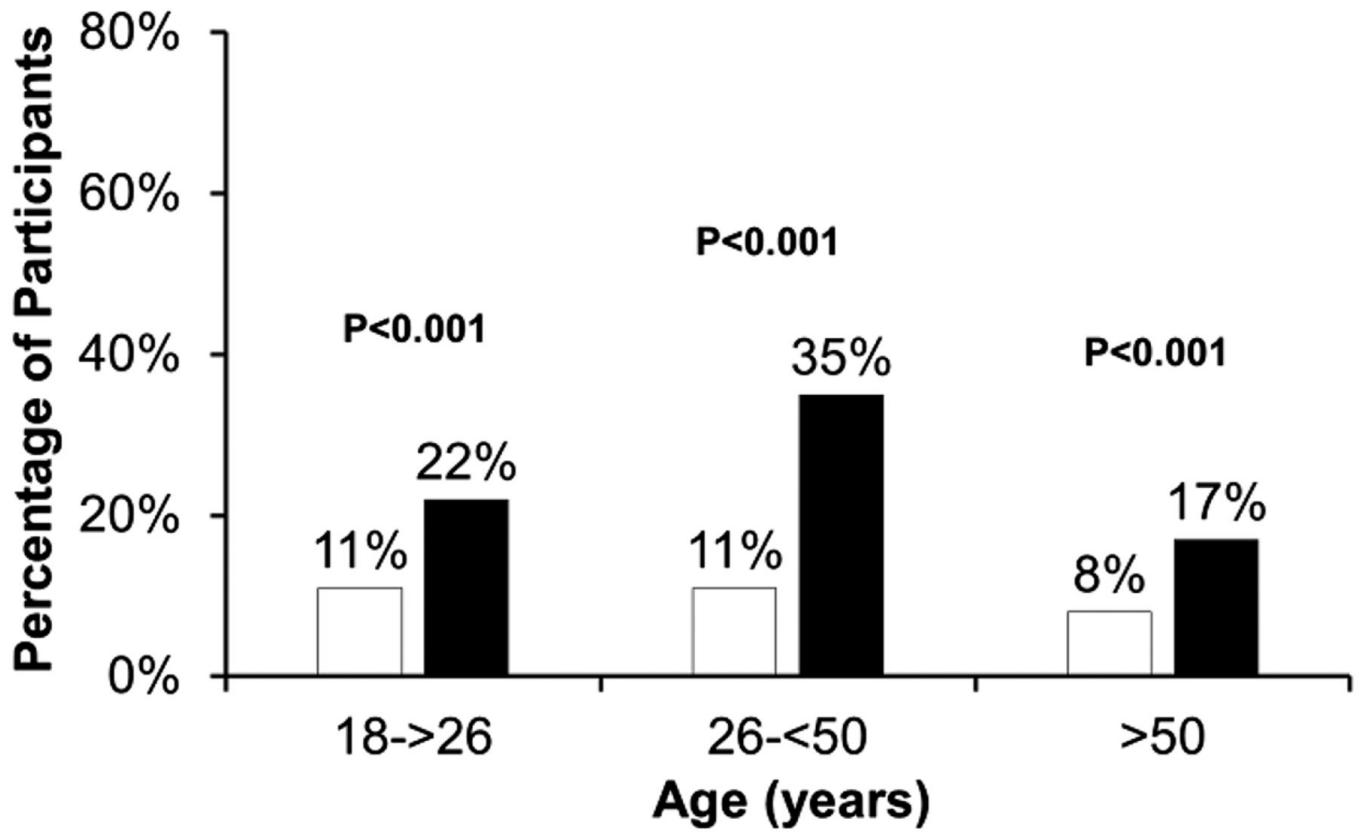
Figure 1—Use of adjuvant noninsulin medication by registry, stratified by age range. Solid white bar, metformin; solid black bar, DPP-4 inhibitor; horizontal striped bar, GLP-1 agonist; dotted bar, SGLT2 inhibitor; vertical striped bar, other.

Diabetes Care Volume 39, October 2016

International Comparison of Smoking and Metabolic Control in Patients With Type 1 Diabetes

Diabetes Care 2016;39:e177–e178 | DOI: 10.2337/dc16-0845

Sabine E. Hofer,[1] Kellee Miller,[2] Julia M. Hermann,[3,4] Daniel J. DeSalvo,[5] Michaela Riedl,[6] Irl B. Hirsch,[7] Wolfram Karges,[8] Roy W. Beck,[2] Reinhard W. Holl,[3,4] and David M. Maahs,[9] for the DPV Initiative and the T1D Exchange Clinic Network**



Prevalence of Celiac Disease in 52,721 Youth With Type 1 Diabetes: International Comparison Across Three Continents

Diabetes Care 2017;40:1034–1040 | https://doi.org/10.2337/dc16-2508

Maria E. Craig,[1,2,3] Nicole Prinz,[4,5] Claire T. Boyle,[6] Fiona M. Campbell,[7] Timothy W. Jones,[8,9] Sabine E. Hofer,[10] Jill H. Simmons,[11] Naomi Holman,[12] Elaine Tham,[13] Elke Fröhlich-Reiterer,[14] Stephanie DuBose,[6] Helen Thornton,[15] Bruce King,[16] David M. Maahs,[17] Reinhard W. Holl,[4,5] and Justin T. Warner,[18] on behalf of the Australasian Diabetes Data Network (ADDN), the T1D Exchange Clinic Network (T1DX), the National Paediatric Diabetes Audit (NPDA) and the Royal College of Paediatrics and Child Health, and the Prospective Diabetes Follow-up Registry (DPV) initiative*

RESULTS

Biopsy-confirmed CD was present in 1,835 youths (3.5%) and was diagnosed at a median age of 8.1 years (interquartile range 5.3–11.2 years). Diabetes duration at CD diagnosis was <1 year in 37% of youths, >1–2 years in 18% of youths, >3–5 years in 23% of youths, and >5 years in 17% of youths. CD prevalence ranged from 1.9% in the T1DX to 7.7% in the ADDN and was higher in girls than boys (4.3% vs. 2.7%, $P < 0.001$). Children with coexisting CD were younger at diabetes diagnosis compared with those with type 1 diabetes only (5.4 vs. 7.0 years of age, $P < 0.001$) and fewer were non-white (15 vs. 18%, $P < 0.001$). Height SDS was lower in those with CD (0.36 vs. 0.48, adjusted $P < 0.001$) and fewer were overweight/obese (34 vs. 37%, adjusted $P < 0.001$), whereas mean HbA_{1c} values were comparable: 8.3 ± 1.5% (67 ± 17 mmol/mol) versus 8.4 ± 1.6% (68 ± 17 mmol/mol).

CONCLUSIONS

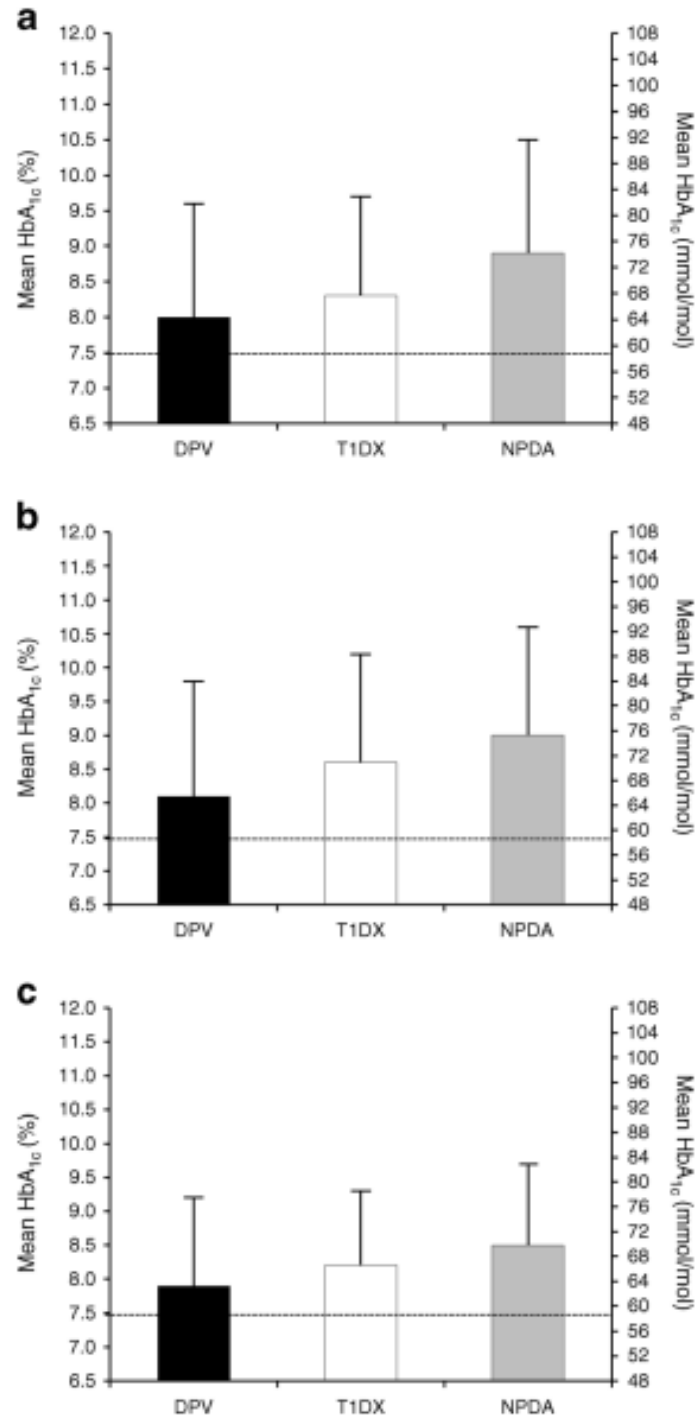
CD is a common comorbidity in youth with type 1 diabetes. Differences in CD prevalence may reflect international variation in screening and diagnostic practices, and/or CD risk. Although glycemic control was not different, the lower height SDS supports close monitoring of growth and nutrition in this population.

Diabetologia (2016) 59:87–91
DOI 10.1007/s00125-015-3790-6

SHORT COMMUNICATION

Use of insulin pump therapy in children and adolescents with type 1 diabetes and its impact on metabolic control: comparison of results from three large, transatlantic paediatric registries

Jennifer L. Sherr[1] · Julia M. Hermann[2] · Fiona Campbell[3] · Nicole C. Foster[4] · Sabine E. Hofer[5] · Jeremy Allgrove[6] · David M. Maahs[7] · Thomas M. Kapellen[8] · Naomi Holman[9] · William V. Tamborlane[1] · Reinhard W. Holl[2] · Roy W. Beck[4] · Justin T. Warner[10] · for the T1D Exchange Clinic Network, the DPV Initiative, and the National Paediatric Diabetes Audit and the Royal College of Paediatrics and Child Health registries



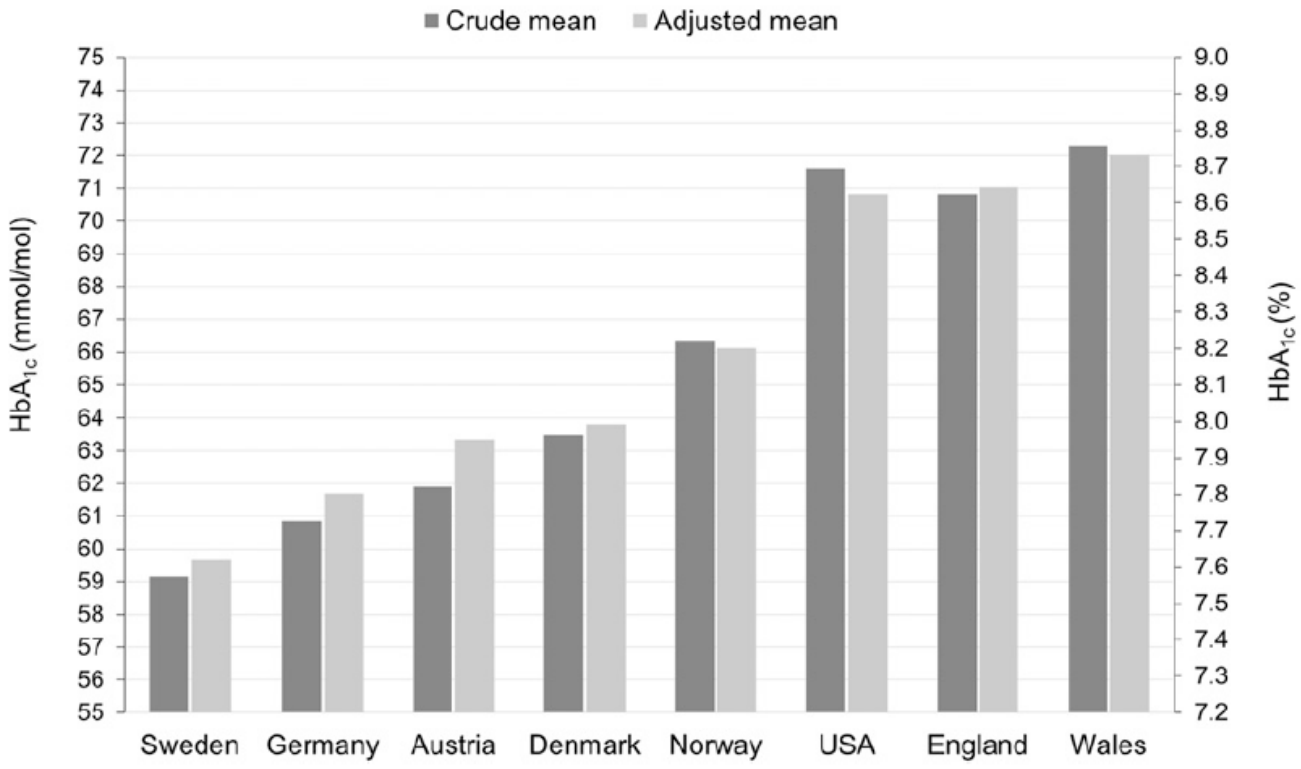
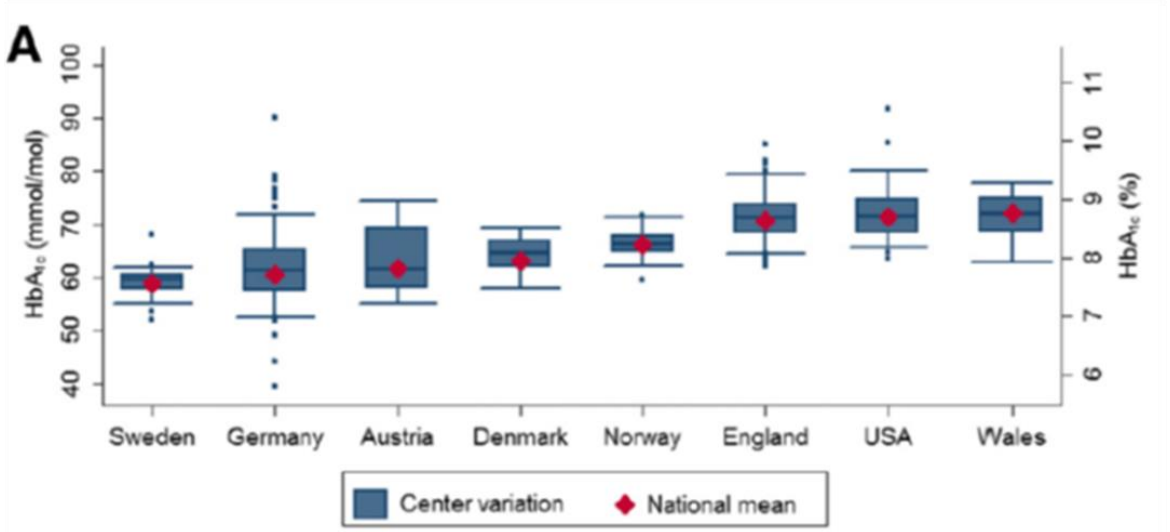


Figure 2—Country mean HbA_{1c} before and after adjustment for cross-country differences in the characteristics of children (age, sex, diabetes duration, and minority status) and center effects. Estimates of adjusted country means derived from a two-level model with a random effect for center including data from all eight countries.

Exploring Variation in Glycemic Control Across and Within Eight High-Income Countries: A Cross-Sectional Analysis of 64,666 Children and Adolescents With Type 1 Diabetes

Dimitrios Charalampopoulos,[1] Julia M. Hermann,[2,3] Jannet Svensson,[4] Torild Skrivarhaug,[5] David M. Maahs,[6] Karin Akesson,[7] Justin T. Warner,[8] Reinhard W. Holl,[2,3] Niels H. Birkebæk,[9] Ann K. Drivvoll,[5] Kellee M. Miller,[10] Ann-Marie Svensson,[11] Terence Stephenson,[1] Sabine E. Hofer,[12] Siri Fredheim,[4] Siv J. Kummernes,[5] Nicole Foster,[10] Lena Hanberger,[13] Rakesh Amin,[1] Birgit Rami-Merhar,[14] Anders Johansen,[15] Knut Dahl-Jørgensen,[16,17] Mark Clements,[18,19,20] and Ragnar Hanas[21,22]

https://doi.org/10.2337/dc17-2271



Charalampopoulos, Diabetes Care '18

Received: 30 October 2019 | Revised: 24 March 2020 | Accepted: 29 March 2020
DOI: 10.1111/pedi.13014

CLINICAL CARE AND TECHNOLOGY

ISPAD WILEY

International benchmarking in type 1 diabetes: Large difference in childhood HbA1c between eight high-income countries but similar rise during adolescence—A quality registry study

Johan Anderzén[1] | Julia M. Hermann[2,3] | Ulf Samuelsson[4] | Dimitrios Charalampopoulos[5] | Jannet Svensson[6] | Torild Skrivarhaug[7] | Elke Fröhlich-Reiterer[8] | David M. Maahs[9] | Karin Akesson[1,10] | Thomas Kapellen[11] | Maria Fritsch[12] | Niels H. Birkebæk[13] | Ann K. Drivvoll[7] | Kellee Miller[14] | Terence Stephenson[5] | Sabine E. Hofer[15] | Siri Fredheim[6] | Siv J. Kummernes[7] | Nicole Foster[14] | Rakesh Amin[5] | Dörte Hilgard[16] | Birgit Rami-Merhar[12] | Knut Dahl-Jørgensen[7] | Mark Clements[17,18,19] | Ragnar Hanas[20] | Reinhard W. Holl[2,3] | Justin T. Warner[21†]

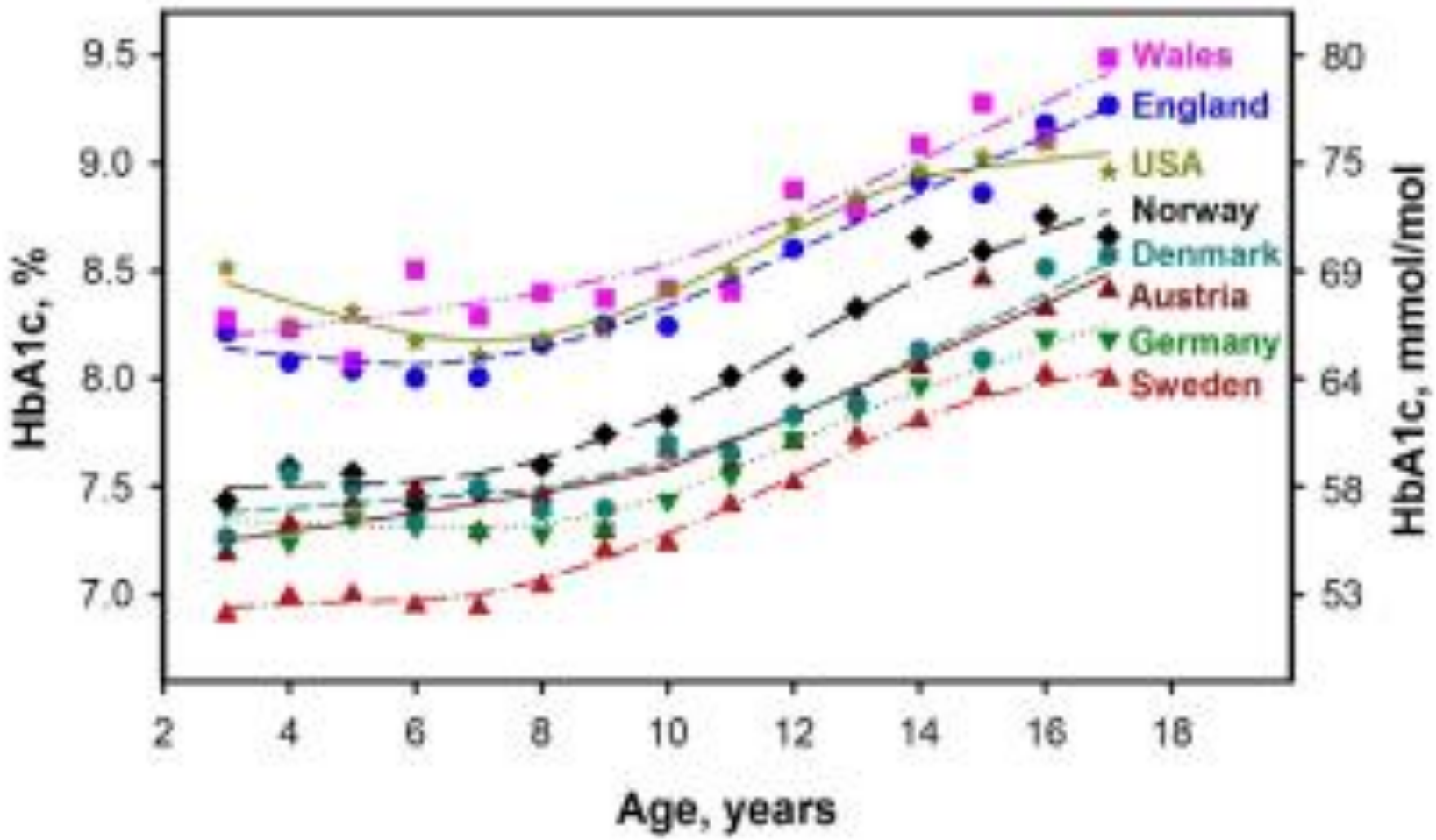


FIGURE 1 HbA1c by age, including a non-parametric local regression of smoothing = LOESS

Hemoglobin A1c Patterns of Youth With Type 1 Diabetes 10 Years Post Diagnosis From 3 Continents

Jennifer L. Sherr, MD, PhD,[a] Anke Schwandt, PhD,[b,c] Helen Phelan, MPH,[d,e] Mark A. Clements, MD, PhD,[f,g] Reinhard W. Holl, MD, PhD,[b,c] Paul Z. Benitez-Aguirre, MD,[e,h] Kellee M. Miller, PhD,[i] Joachim Woelfle, MD,[j] Thomas Dover, MD,[k,l] David M. Maahs, MD, PhD,[m,n] Elke Fröhlich-Reiterer, MD,[o] Maria E. Craig, MD[e,h]

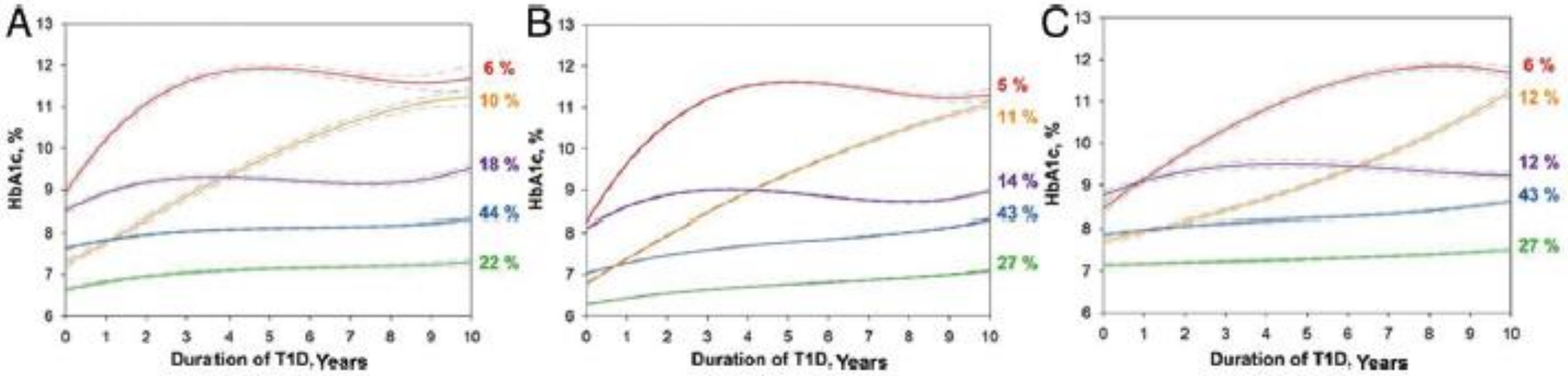


FIGURE 1

HbA1c trajectories with 95% confidence intervals among youth with T1D from the time of diagnosis. A, ADDN ($N = 7292$). B, The German-Austrian-Luxembourgian-Swiss diabetes prospective follow-up (DPV; $N = 39226$). C, US T1DX ($N = 3704$).

DIABETES TECHNOLOGY & THERAPEUTICS
Volume 24, Number 1, 2022

https://doi-org.laneproxy.stanford.edu/10.1089/dia.2021.0225

ORIGINAL ARTICLE

Changes in HbA1c Between 2011 and 2017 in Germany/Austria, Sweden, and the United States: A Lifespan Perspective

Anastasia Albanese-O'Neill, PhD [1,*], Julia M. Grimsmann, PhD[2,3,*], Ann-Marie Svensson, PhD[4,5], Kellee M. Miller, PhD[6], Klemens Raile, MD[7], Karin Akesson, MD, PhD[8,9], Peter Calhoun, PhD[6], Beate Biesenbach, MD[10], Katarina Eeg-Olofsson, MD, PhD [5], Reinhard W. Holl, MD [2,3], David M. Maahs, MD, PhD[11,12,†], and Ragnar Hanas, MD, PhD [13,14,†]

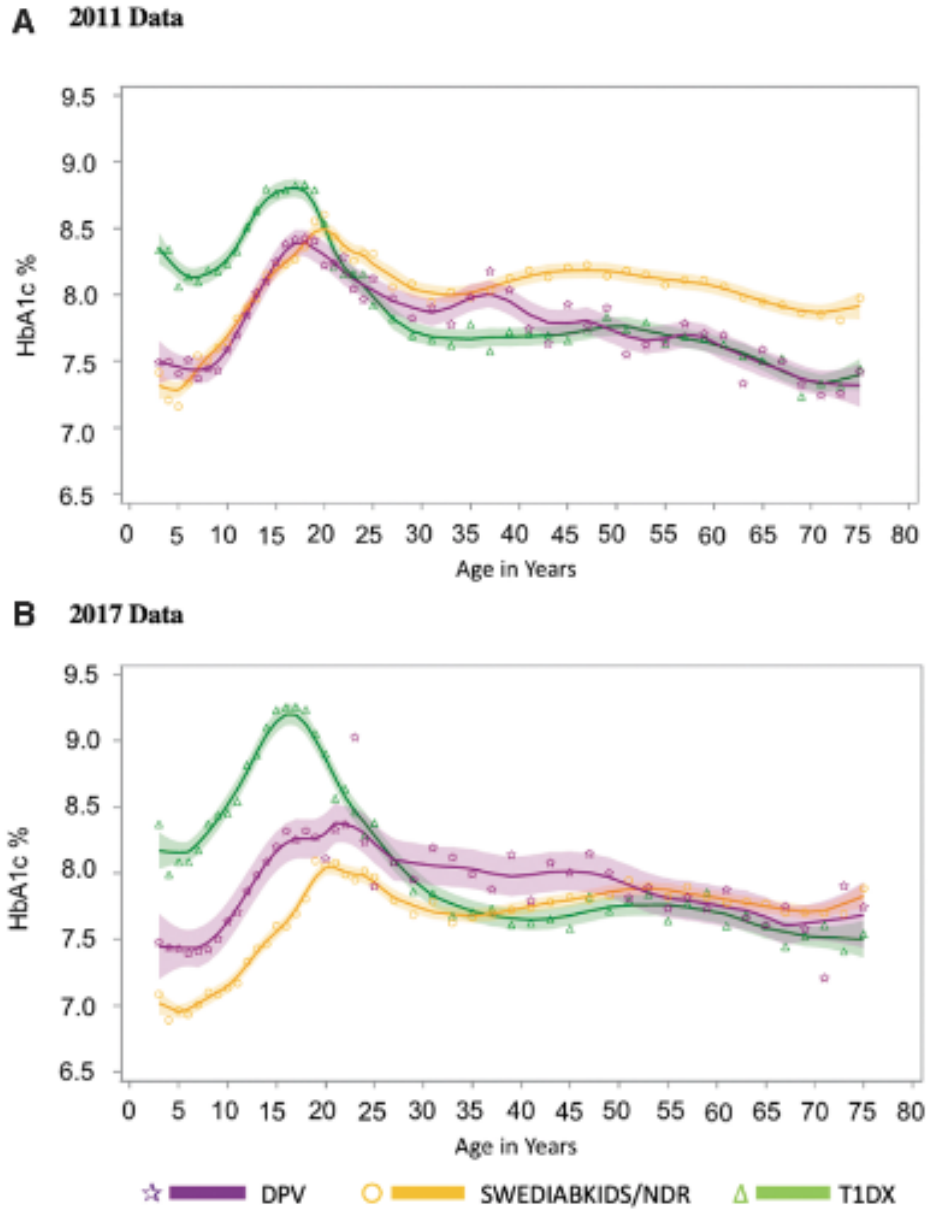
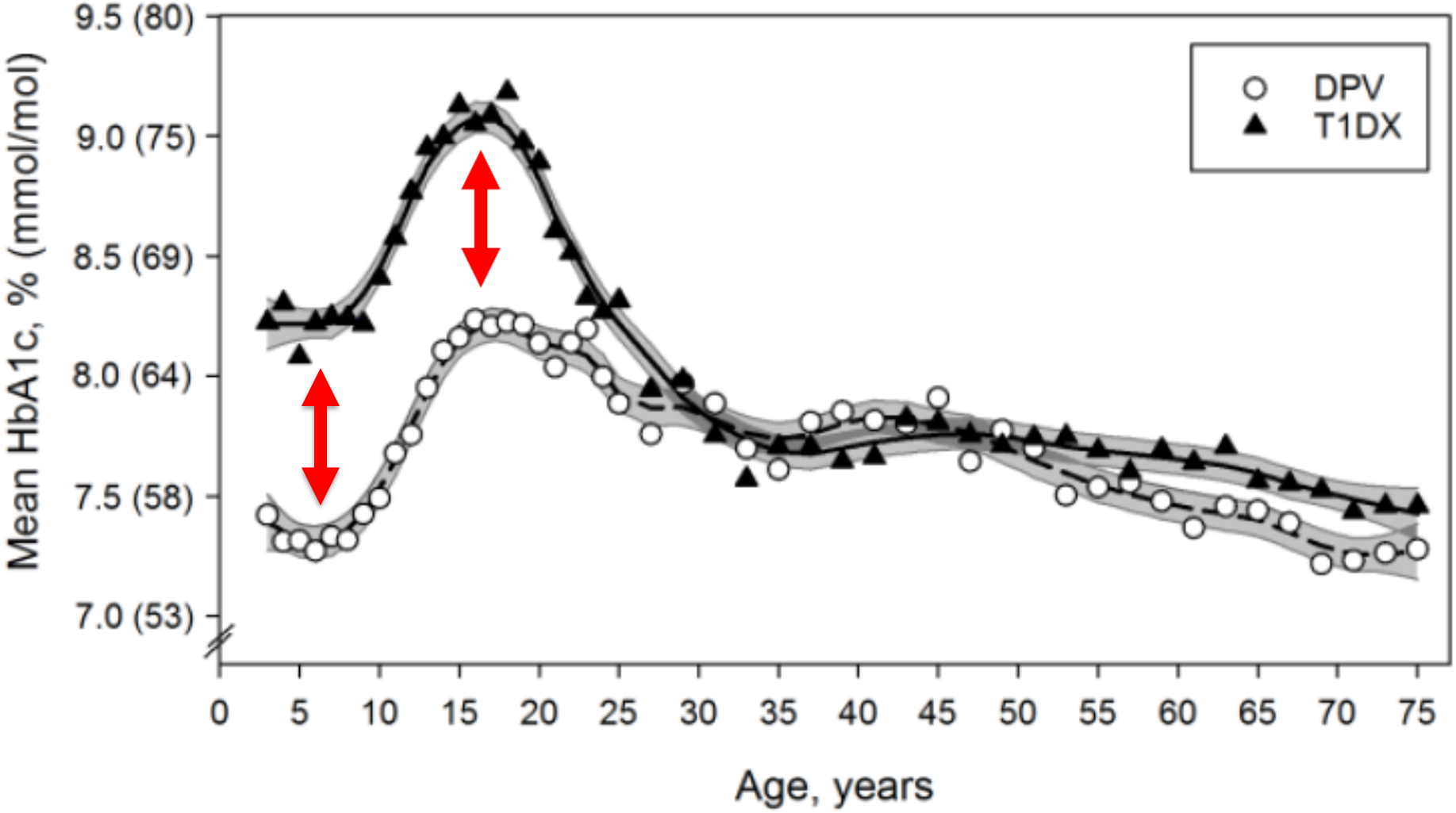


FIG. 2. Changes in HbA1c Across the Lifespan, All Registries. **(A)** 2011 Data **(B)** 2107 Data. German/Austrian data are represented in burgundy (stars), Swedish data are represented in yellow (circles), U.S. data are represented in green (triangles). Circles/triangles/stars express HbA1c for each year of age by registry. The line and shaded area represent the LOESS fit +95% confidence interval.

HbA1c by Age
DPV (Germany/Austria) Compared to T1DX (US)



N=51,024 Hermann, Diabetic Medicine '20

Contents available at ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

Type 1 diabetes in older adults: Comparing treatments and chronic complications in the United States T1D Exchange and the German/Austrian DPV registries

Ruth S. Weinstock[a], *Ingrid Schütz-Fuhrmann*[b], *Crystal G. Connor*[c,*], *Julia M. Hermann*[d,e], *David M. Maahs*[f], *Morten Schütt*[g], *Shivani Agarwal*[h], *Sabine E. Hofer*[i], *Roy W. Beck*[c], *Reinhard W. Holl*[d,e], *for the T1D Exchange Clinic Network, and the DPV Initiative*

[a] *SUNY Upstate Medical University, Syracuse, NY, USA*
[b] *Hospital Hietzing, 3rd Medical Department, Vienna, Austria*
[c] *Jaeb Center for Health Research, Tampa, FL, USA*
[d] *University of Ulm, ZIBMT, Institute of Epidemiology and Medical Biometry, Ulm, Germany*
[e] *German Center for Diabetes Research (DZD), Munich-Neuherberg, Germany*
[f] *Stanford University, Palo Alto, CA, USA*
[g] *Medical University of Lübeck, Department of Internal Medicine, Lübeck, Germany*
[h] *University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA*
[i] *Medical University of Innsbruck, Department of Pediatrics, Innsbruck, Austria*

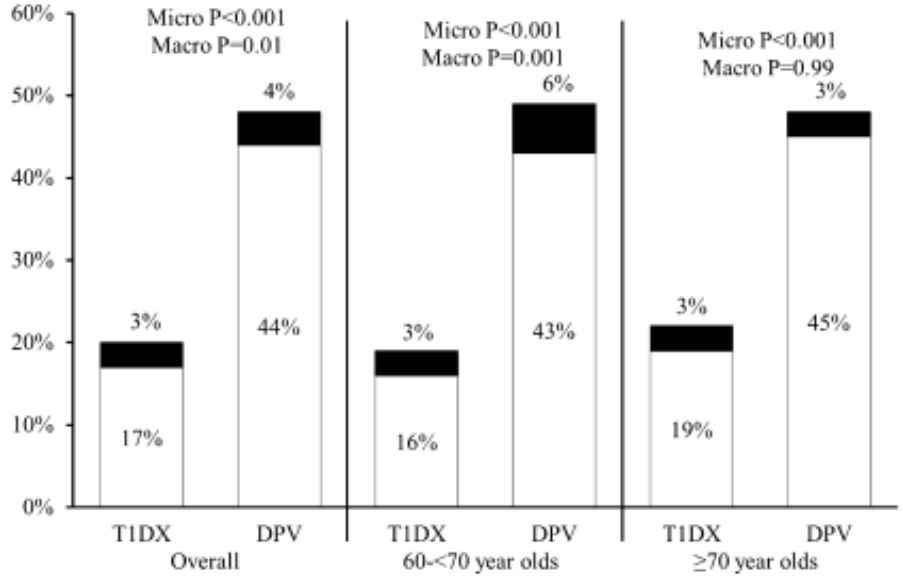


Fig. 1A – Prevalence of renal disease in the T1D Exchange and DPV registries. Solid white bar = urine albumin 30–300 mg/g Cr (microalbuminuria). Solid black bar = urine albumin > 300 mg/g Cr (macroalbuninuria).

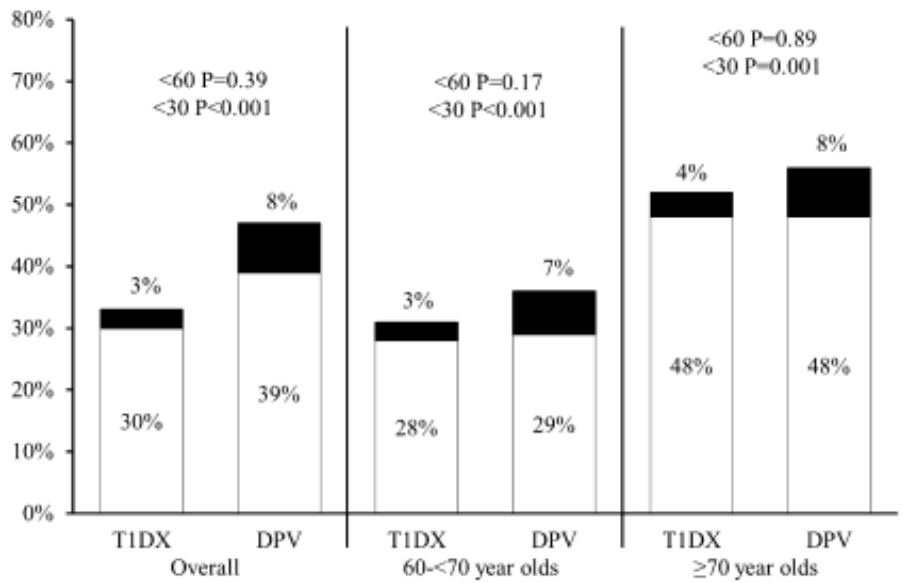


Fig. 1B – Glomerular Filtration Rate in the T1D Exchange and DPV registries. Solid white bar ≤ 60 ml/min/1.73^2. Solid black bar ≤ 30 ml/min/1.73^2. Formula validation limited in those ≥ 70 years of age. All DPV participants analyzed as White/ Caucasian.

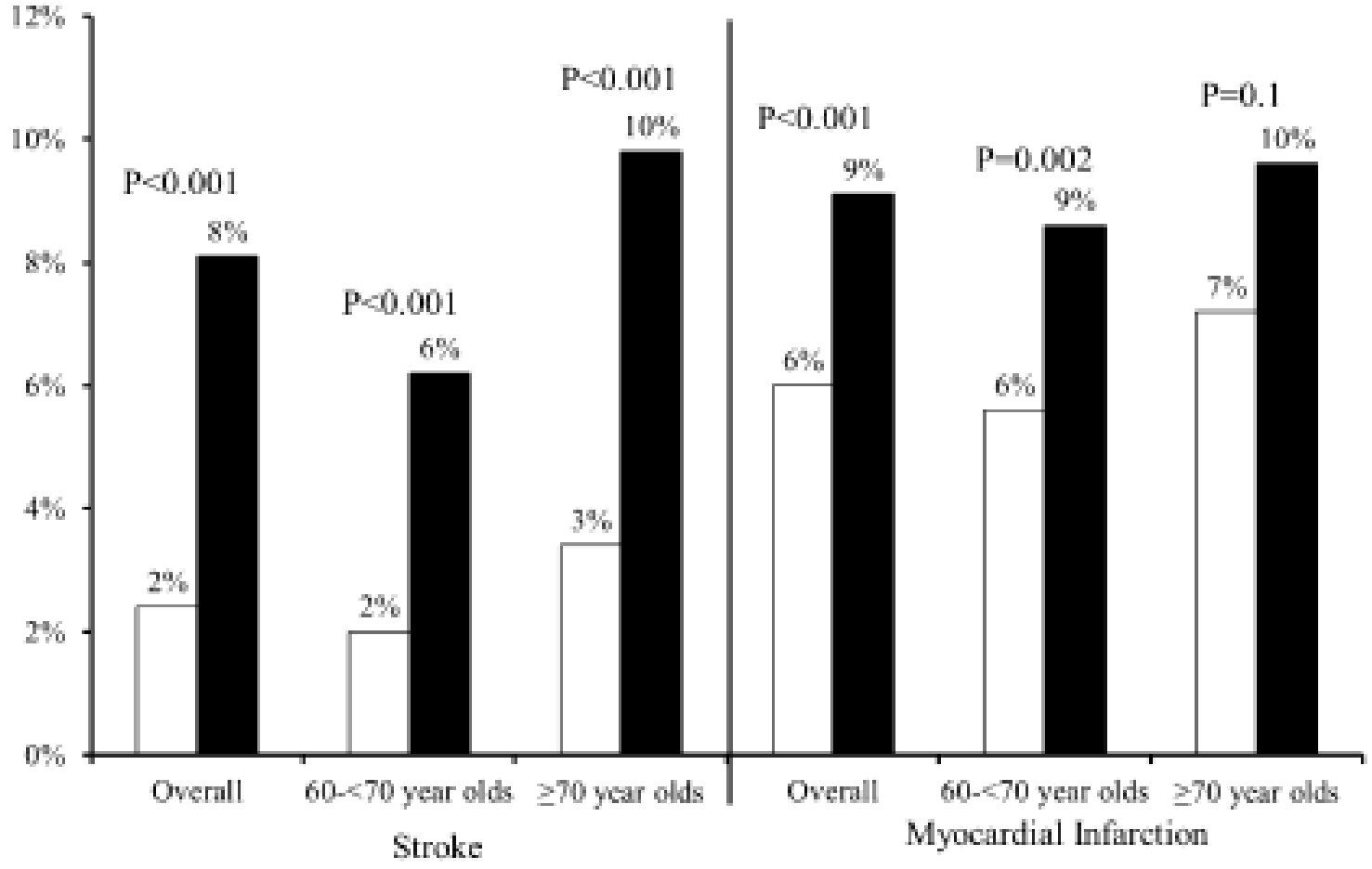


Fig. 1C – Stroke and myocardial infarction in the T1D Exchange and DPV registries. Solid white bar = T1D Exchange registry. Solid black bar = DPV registry.

ORIGINAL ARTICLE

WILEY

Undertreatment of cardiovascular risk factors in the type 1 diabetes exchange clinic network (United States) and the prospective diabetes follow-up (Germany/Austria) registries

Viral N. Shah MD[1] | Julia M. Grimsmann PhD[2,3] | Nicole C. Foster MS[4] | Axel Dost MD[5] | Kellee M. Miller PhD[4] | Marianne Pavel MD[6] | Ruth S. Weinstock MD[7] | Wolfram Karges PhD[8] | David M. Maahs MD[9,10] | Reinhard W. Holl MD[2,3]

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[4]Jaeb Center for Health Research, Tampa, Florida

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[9]Department of Pediatrics, School of Medicine, Stanford University, Stanford, California

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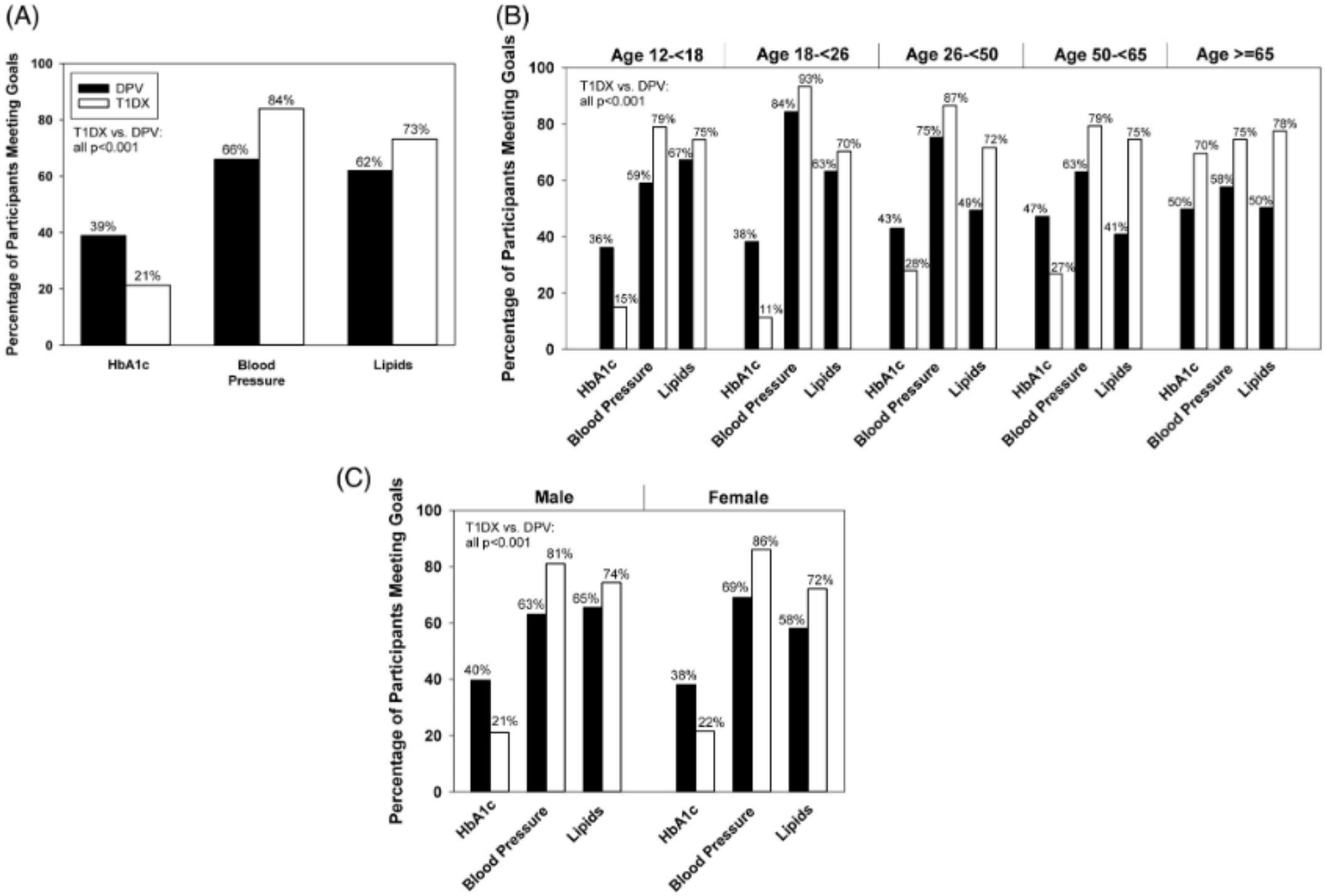


FIGURE 1 Percentage of participants meeting glycaemic, blood pressure and lipid goals (A) in the T1DX and DPV registries by age group (B) and sex (C)

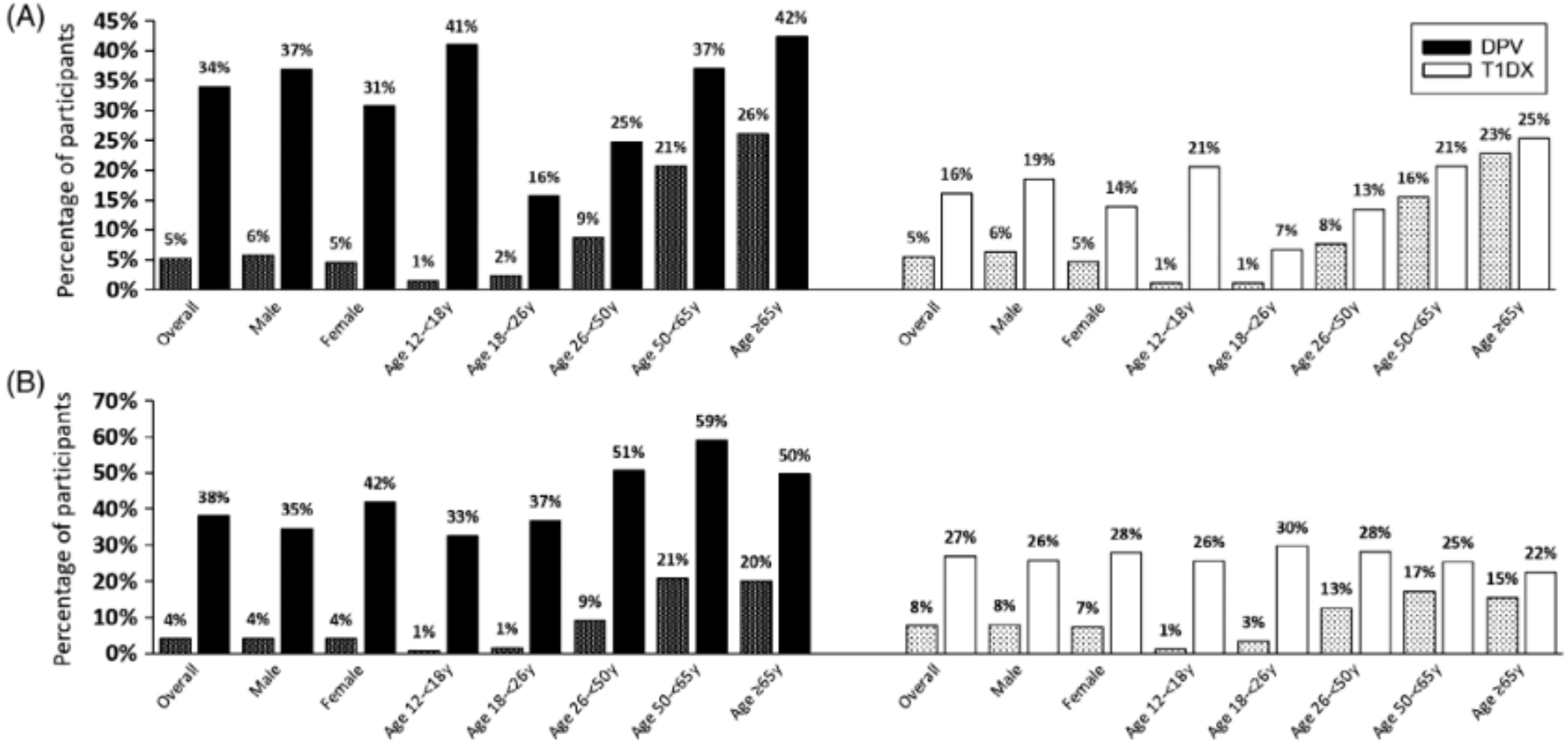
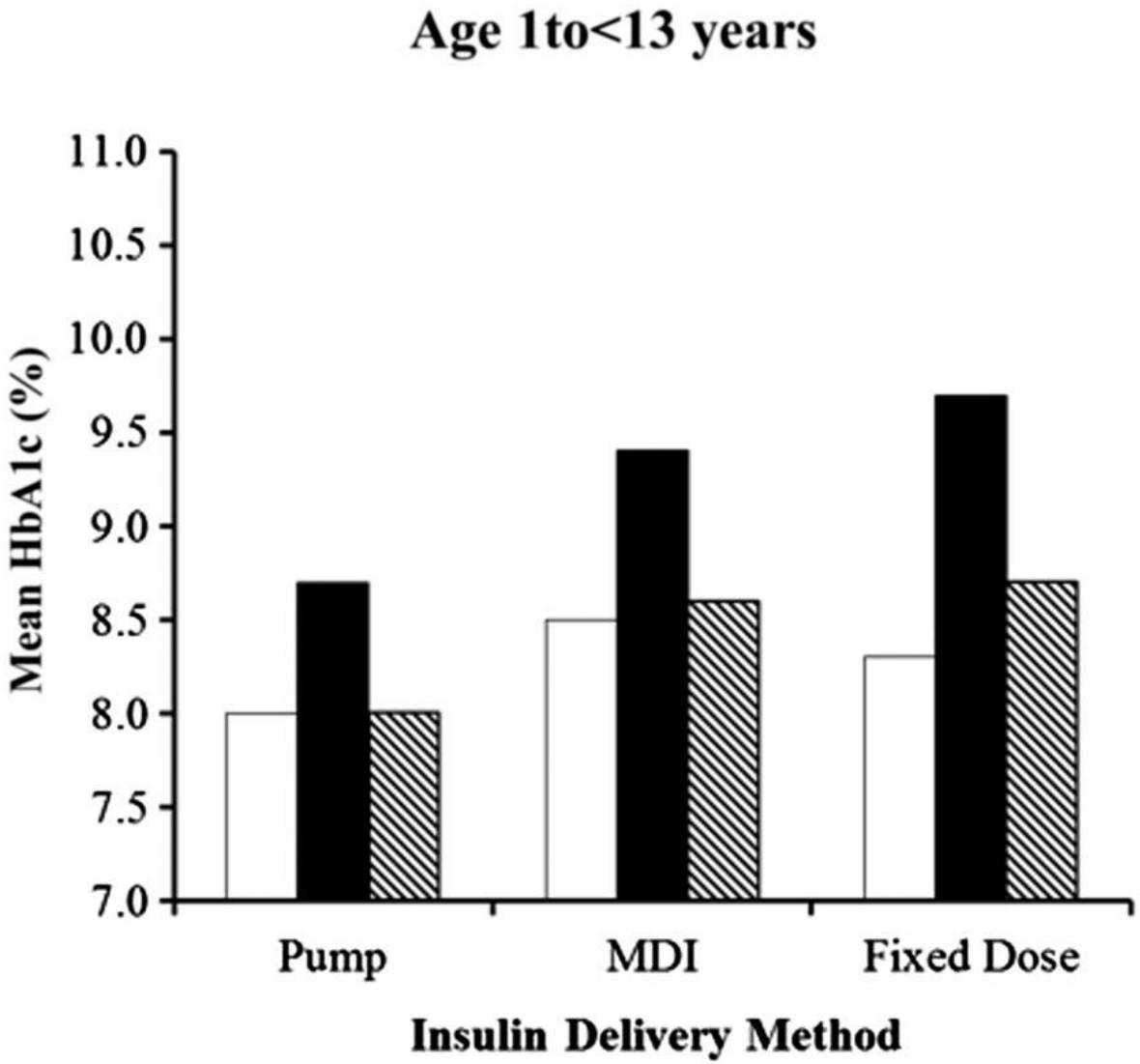
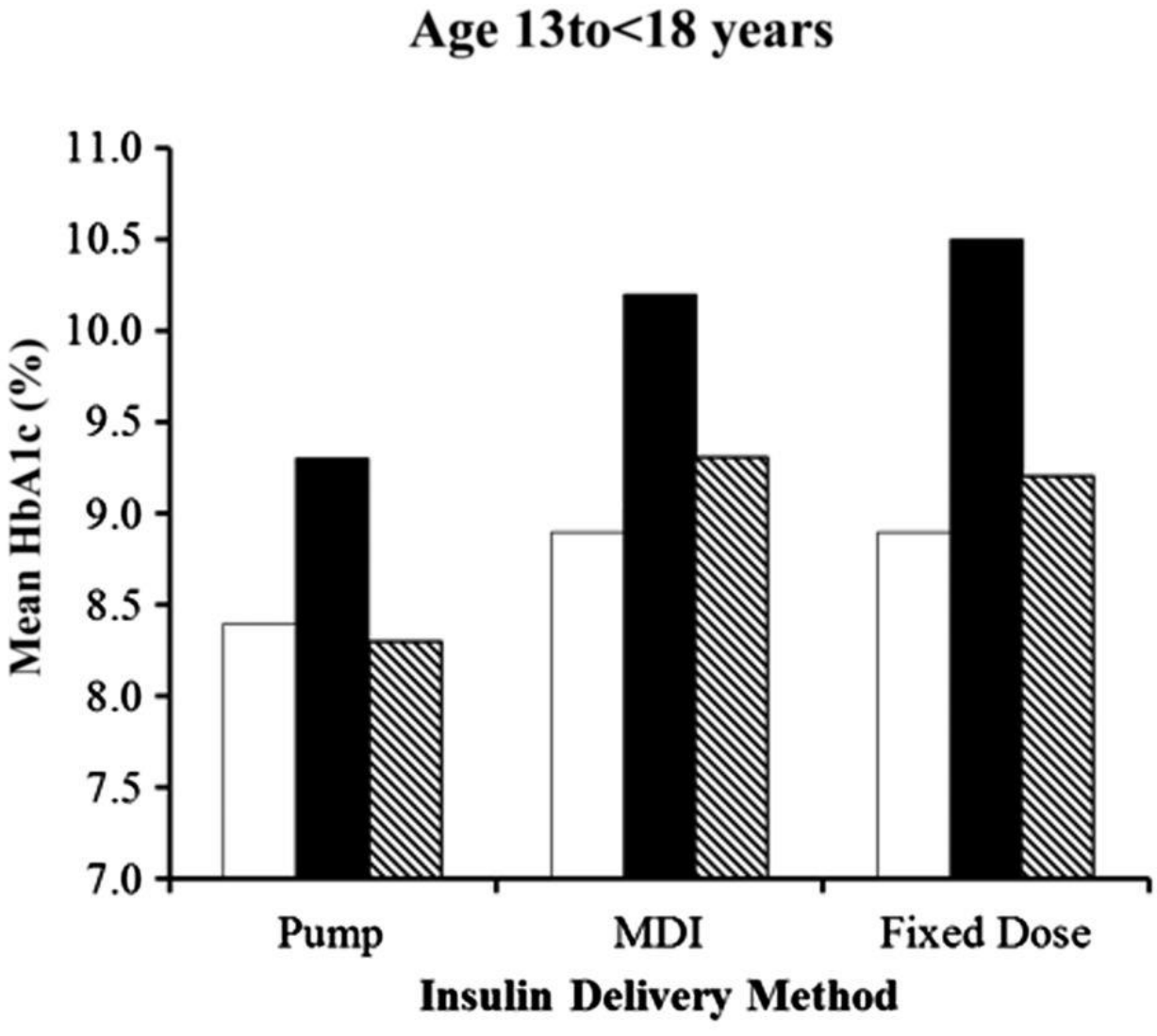


FIGURE 2 Frequency of antihypertensive medication use in those with hypertension (A) and use of lipid-lowering medication in those with dyslipidaemia (B) in T1DX and DPV registries by age group and sex

Challenges for T1D Care in the US

Diabetes Technology & Disparities





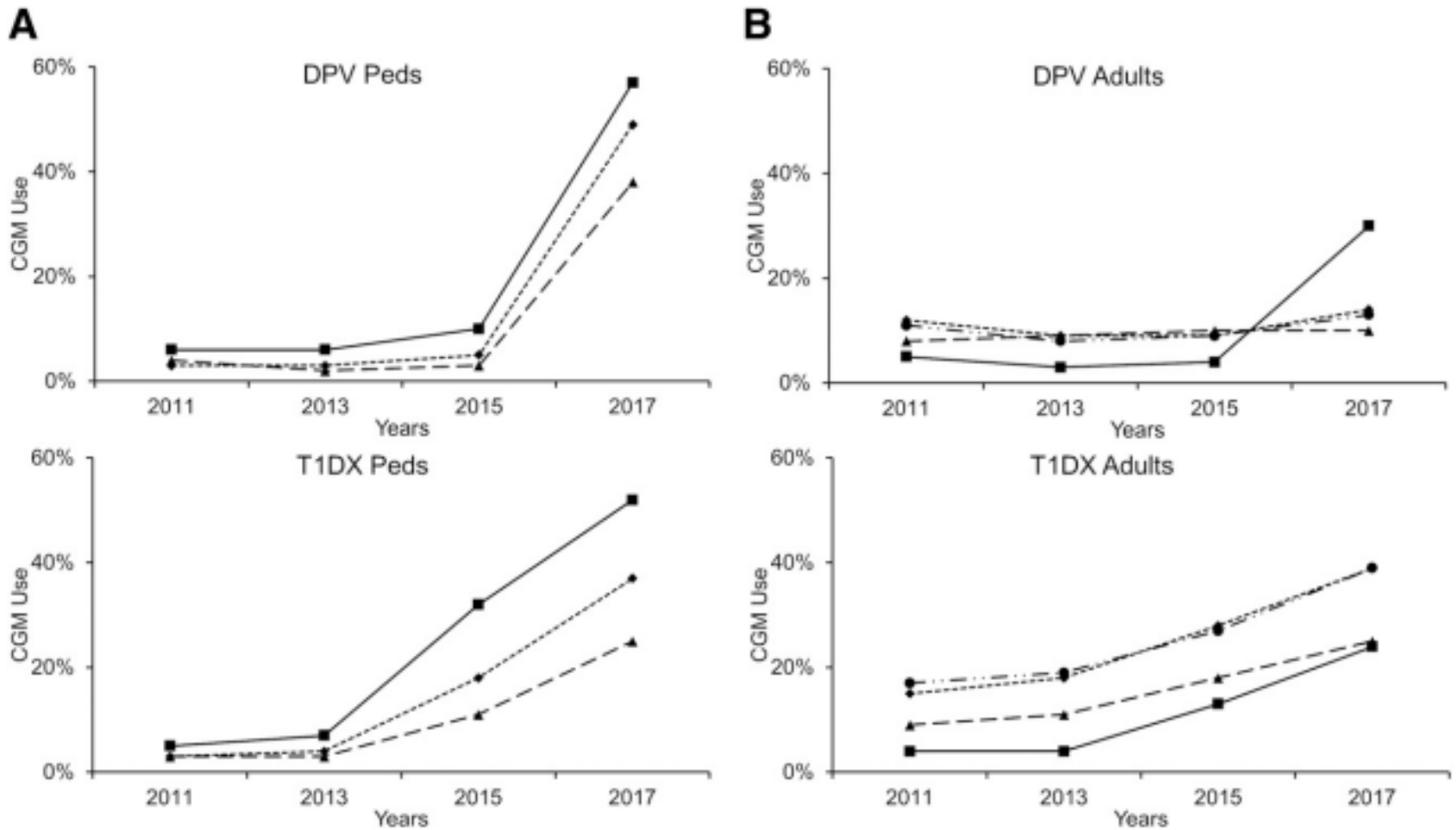
Mean HbA1c level according to race/ethnicity and insulin regimen/method. MDI, multiple daily injections. White bar, non-Hispanic white; black bar, non-Hispanic black; black and white striped bar, Hispanic. **Willi et al *Pediatrics '15***

Diabetes Care Volume 43, January 2020

Longitudinal Changes in Continuous Glucose Monitoring Use Among Individuals With Type 1 Diabetes: International Comparison in the German and Austrian DPV and U.S. T1D Exchange Registries

Kellee M. Miller,[1] Julia Hermann,[2,3] Nicole Foster,[1] Sabine E. Hofer,[4] Michael R. Rickels,[5] Thomas Danne,[6] Mark A. Clements,[7] Eggert Lilienthal,[8] David M. Maahs,[9,10] and Reinhard W. Holl,[2,3] for the T1D Exchange and DPV Registries

Diabetes Care 2020;43:e1–e2 | https://doi.org/10.2337/dc19-1214



DIABETES TECHNOLOGY & THERAPEUTICS
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BRIEF REPORTS

Transatlantic Comparison of Pediatric Continuous Glucose Monitoring Use in the Diabetes-Patienten-Verlaufsdokumentation Initiative and Type 1 Diabetes Exchange Quality Improvement Collaborative

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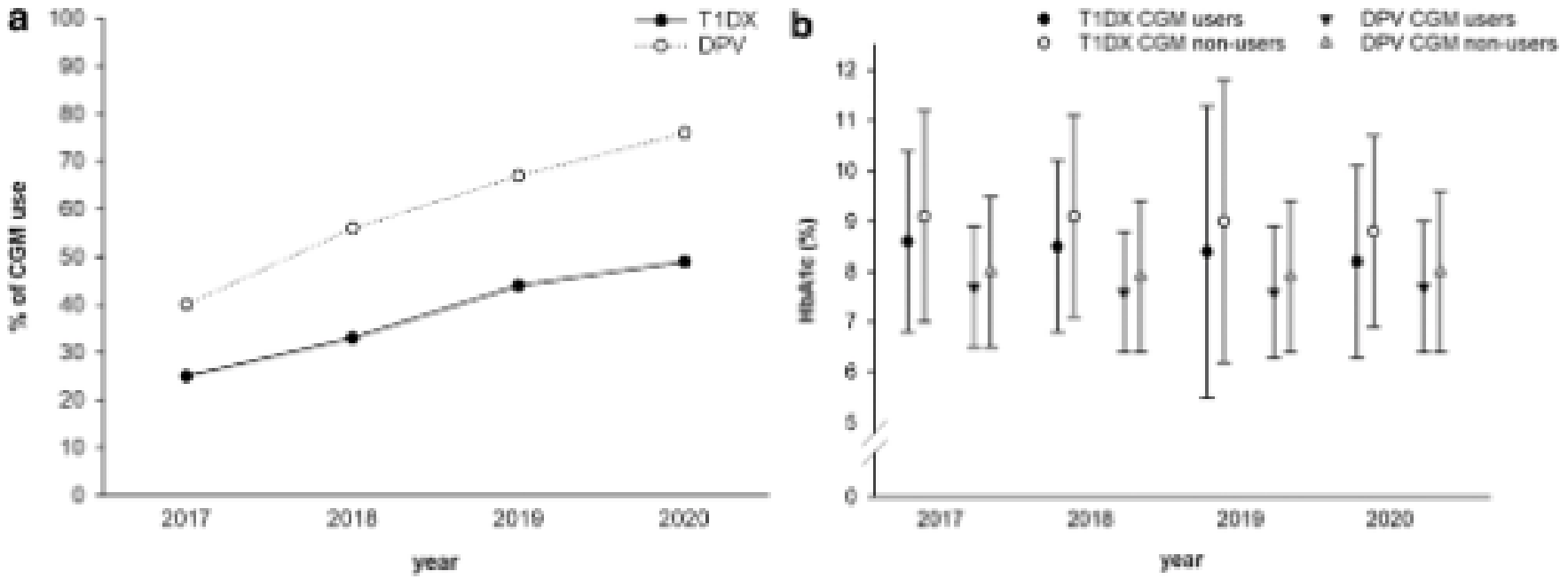

FIG. 1. (a) Proportion of CGM use from 2017 to 2020 among those <25 years of age. (b) HbA1c (%) in CGM users compared with nonusers. CGM, continuous glucose monitoring; HbA1c, hemoglobin A1c.

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DTT

ORIGINAL ARTICLE

State of Type 1 Diabetes Management and Outcomes from the T1D Exchange in 2016–2018

Nicole C. Foster, MS,[1] Roy W. Beck, MD, PhD,[1] Kellee M. Miller, PhD,[1] Mark A. Clements, MD,[2] Michael R. Rickels, MD, MS,[3] Linda A. DiMeglio, MD, MPH,[4] David M. Maahs, MD, PhD,[5] William V. Tamborlane, MD,[6] Richard Bergenstal, MD,[7] Elizabeth Smith, BS,[1] Beth A. Olson, BAN, RN, CDE,[7] and Satish K. Garg, MD[8]; for the T1D Exchange Clinic Network

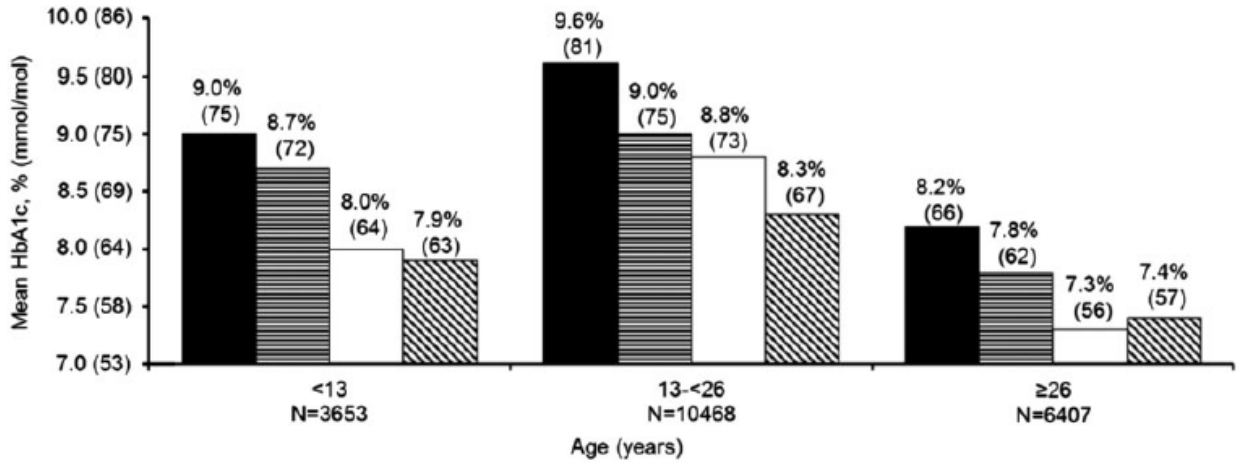

FIG. 3. Mean HbA1c by technology use in 2016–2018. Solid black represents injection only. Horizontal stripes represent pump only. Solid white represents injection+CGM. Diagonal stripes represent pump+CGM.

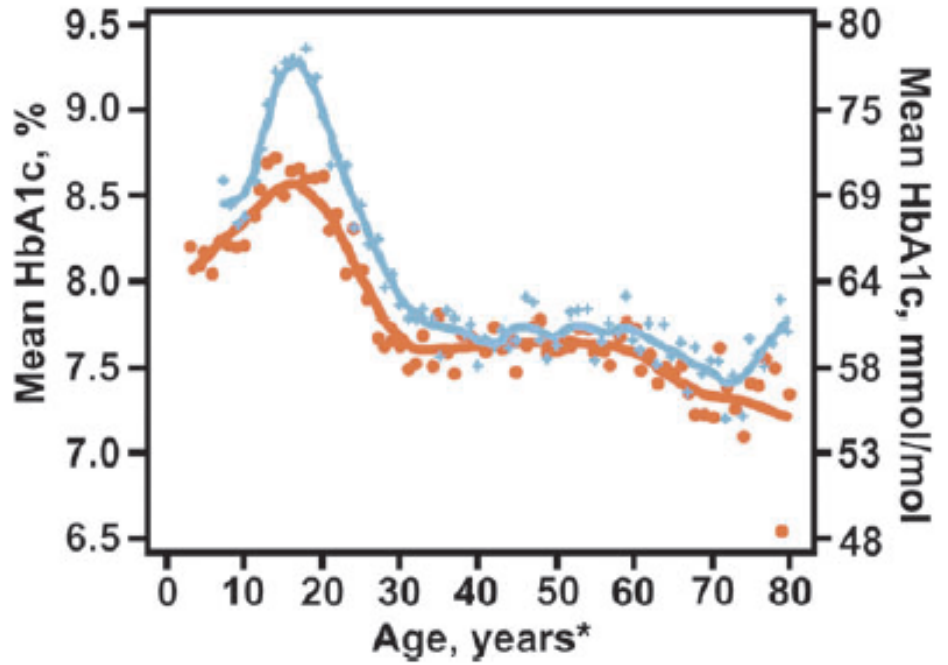

FIG. 2. Average HbA1c by year of age: 2010–2012 versus 2016–2018. Orange line represents 2010–2012 cohort, and blue line represents 2016–2018 cohort. Participants must be contained in both cohorts with at least a 3-year duration for the 2010–2012 collection. * ≥80 years old are pooled.

How to explain increased A1c from 2010-12 to 2016-18?

<u>What is role of</u>:
Diabetes technology
Income
Insurance
Race-ethnicity

DIABETES TECHNOLOGY & THERAPEUTICS
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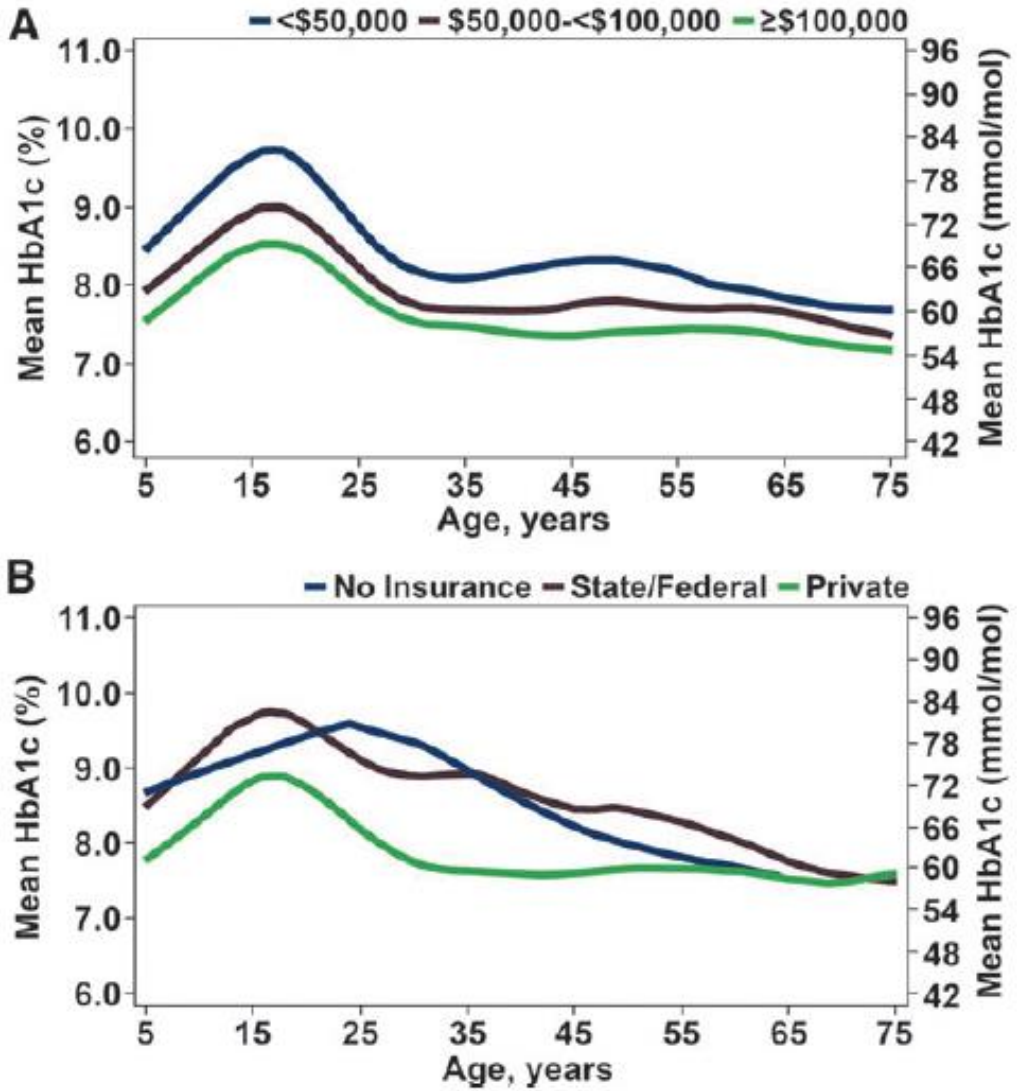
DTT

ORIGINAL ARTICLE

HbA1c Levels in Type 1 Diabetes from Early Childhood to Older Adults: A Deeper Dive into the Influence of Technology and Socioeconomic Status on HbA1c in the T1D Exchange Clinic Registry Findings

Kellee M. Miller, PhD,[1] Roy W. Beck, MD, PhD,[1] Nicole C. Foster, MS,[1] and David M. Maahs, MD, PhD[2]; for the T1D Exchange



Higher A1c:

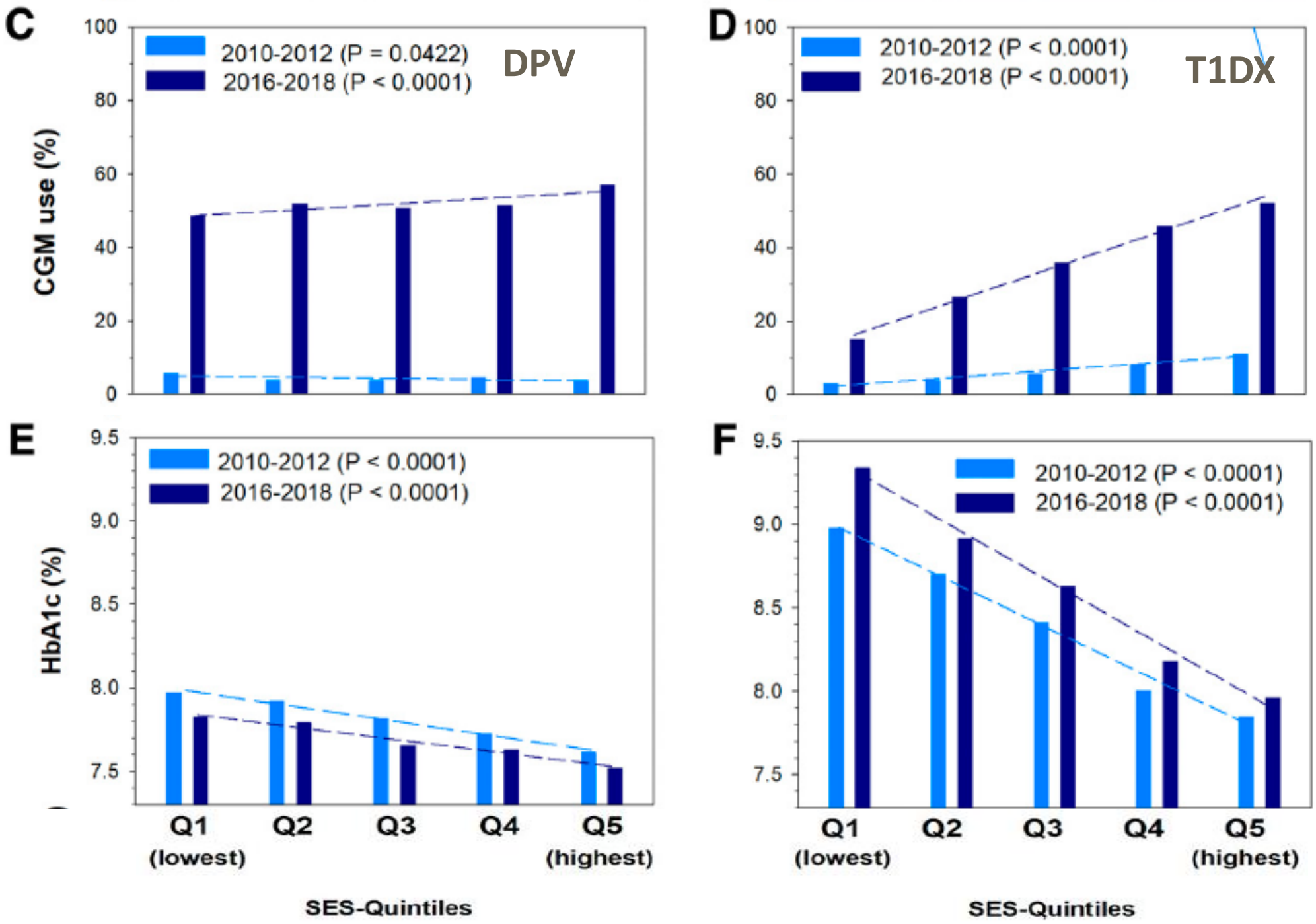
- Public Insurance
- Lower income
- Hispanic or Black v NHW
- No CGM
- MDI v Pump

Miller, DTT ‘20

A Decade of Disparities in Diabetes Technology Use and HbA_{1c} in Pediatric Type 1 Diabetes: A Transatlantic Comparison

Ananta Addala,[1] Marie Auzanneau,[2,3] Kellee Miller,[4] Werner Maier,[3,5] Nicole Foster,[4] Thomas Kapellen,[6] Ashby Walker,[7] Joachim Rosenbauer,[3,8] David M. Maahs,[1,9] and Reinhard W. Holl[2,3]

Diabetes Care 2021;44:133–140 | https://doi.org/10.2337/dc20-0257



- **Greater gap in US v Germany by SES quintile (low v hi):**
  - **Pump: 39 v 6%**
  - **CGM: 37 v 9%**
  - **A1c: 1.3 v 0.3%**
- **SES Gap widening for US from 2010-12 to 2016-18 for CGM (p=0.038) & A1c (p=0.0005)**

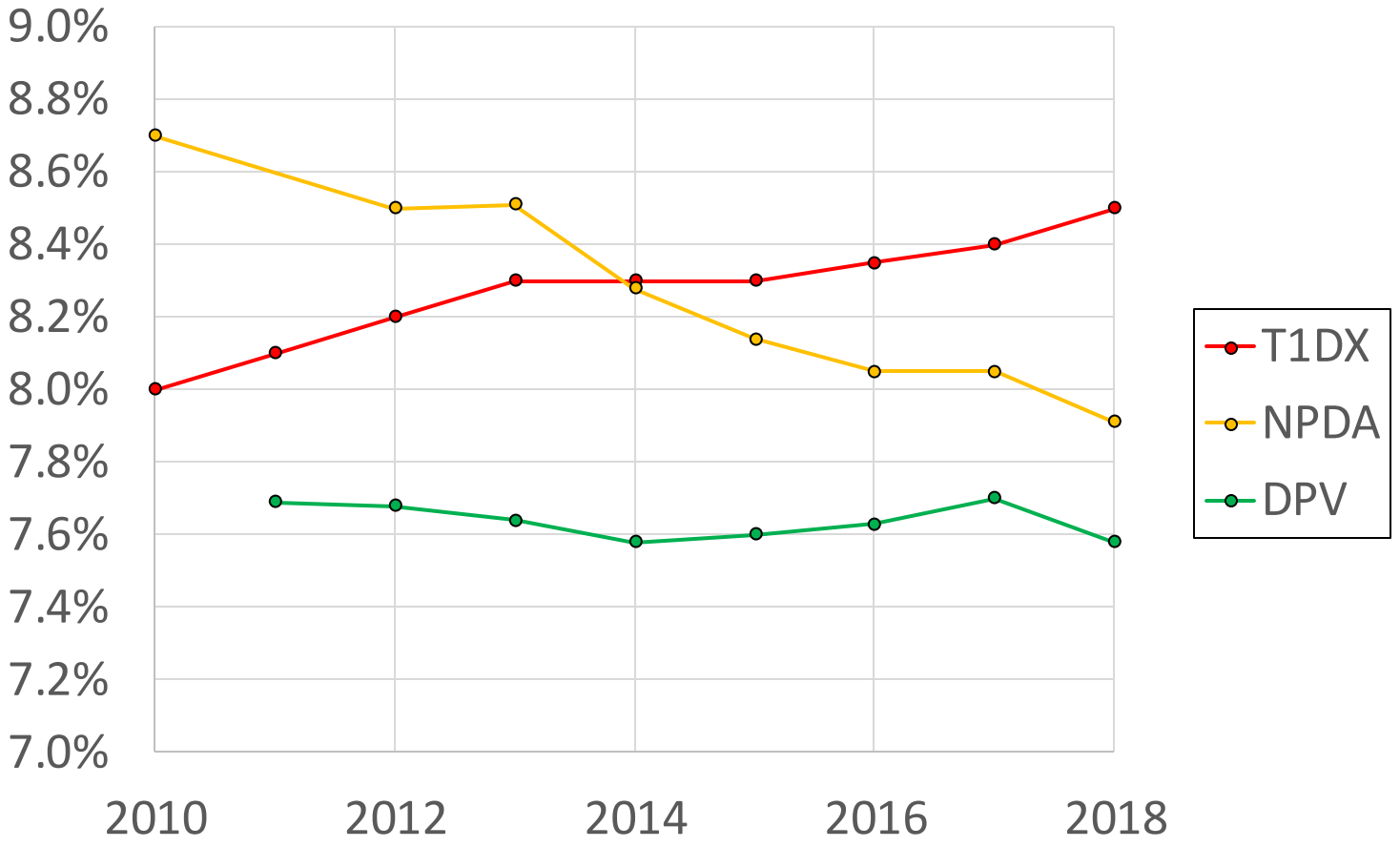
Role of Quality Improvement to Improve Outcomes

Longitudinal Comparison of A1c in 3 Pediatric Diabetes Groups (Lal, DTT ‘22)

T1DX QI, DPV, NPDA

HbA1c by Registry

- Stable and lowest in DPV
- Clinically significant decrease in NPDA
- Clinically significant increase in T1DX



Lal et al, DTT '22

Quality Improvement Efforts – NPDA

- In 2009, the National Clinical Director for Children, Young People and Maternity Services for NPDA commented that "this disappointing situation cannot be allowed to continue". Subsequent QI efforts mandated throughout.

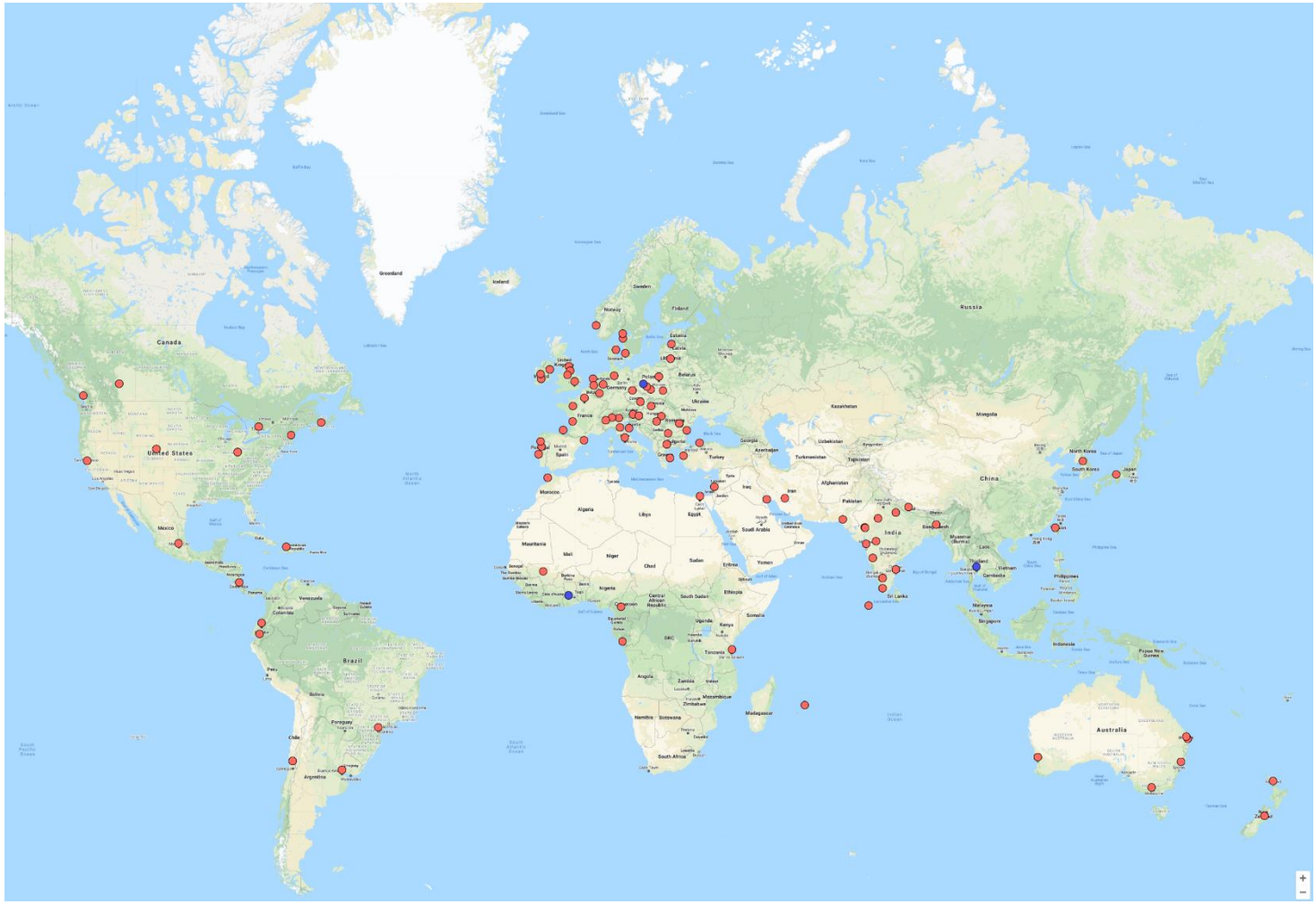
Lal et al, DTT '22

DPV-NPDA-T1DX Longitudinal

- DPV has maintained a population HbA1c < 7.7%
- NPDA has succeeded in reducing the population HbA1c in a clinically meaningful way (>0.7%)
- Further research should focus on how these healthcare systems succeeded
- The United States should consider expanding QI programs nationally to improve HbA1c

The SWEET Map:

Worldwide Pediatric Diabetes Registry 2021



Blue points = new centers in SWEET, submitting data since July 2021

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Mary Ann Liebert, Inc.
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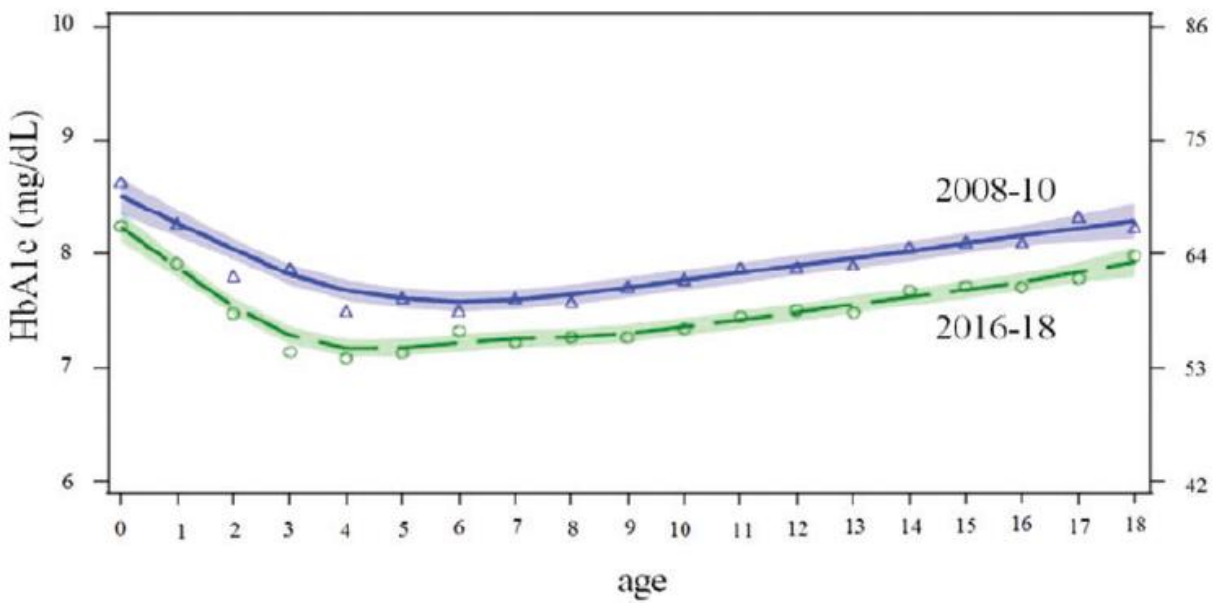
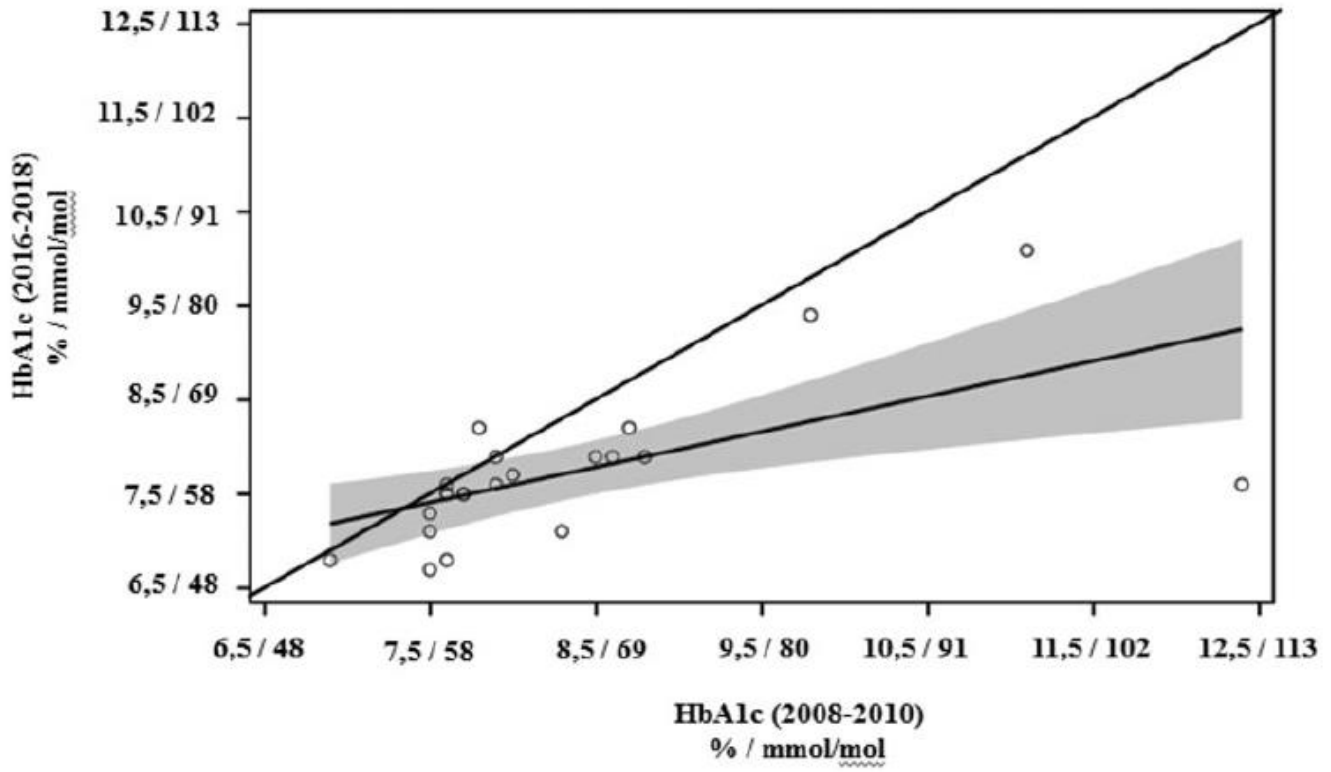
DTT

ORIGINAL ARTICLE

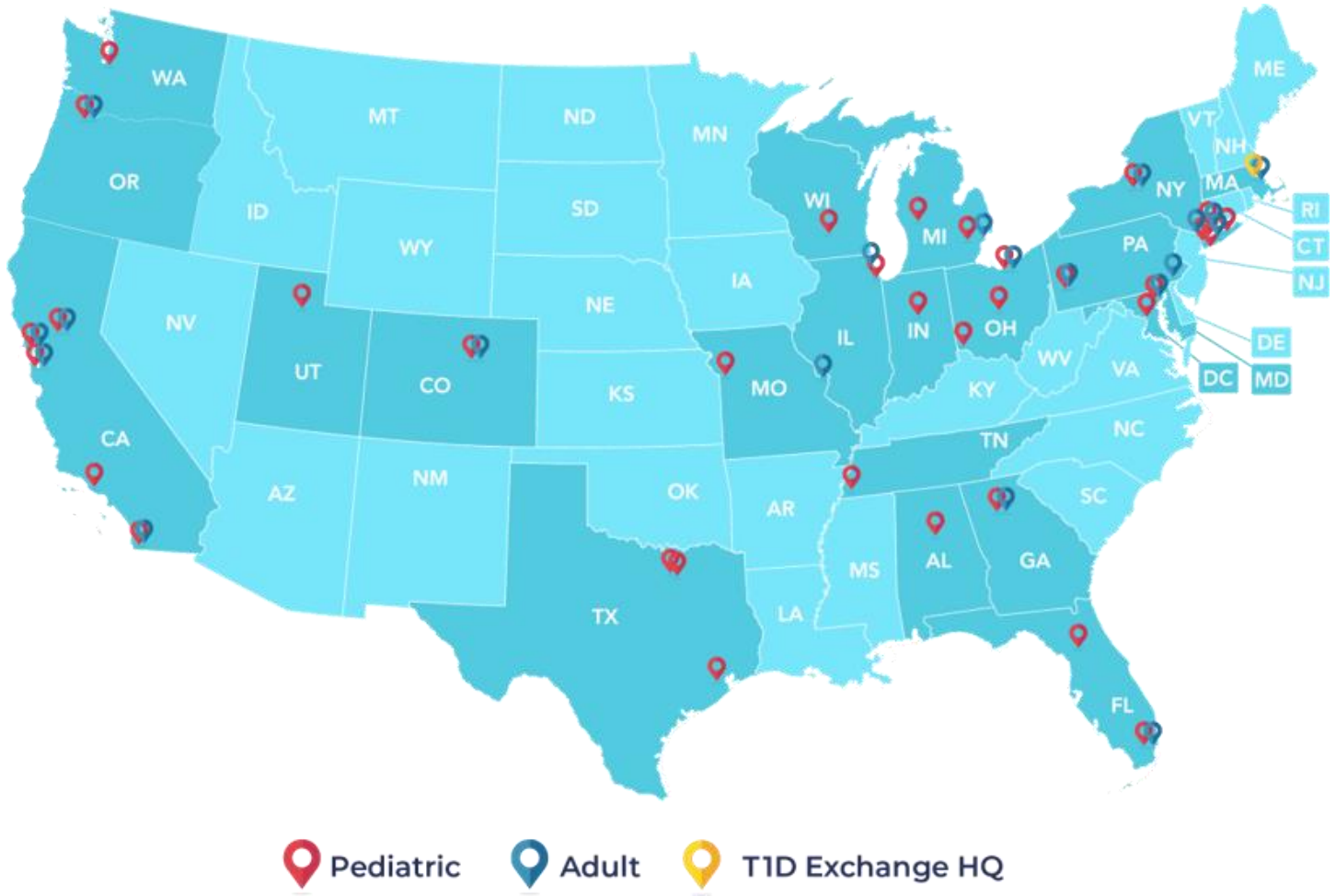
The SWEET Project 10-Year Benchmarking in 19 Countries Worldwide Is Associated with Improved HbA1c and Increased Use of Diabetes Technology in Youth with Type 1 Diabetes

Peter Gerhardsson, MSc,[1] Anke Schwandt, MSc,[2,3] Michael Witsch, MD,[4] Olga Kordonouri, MD, PhD,[5] Jannet Svensson, MD, PhD,[6,7] Gun Forsander, MD, PhD,[8] Tadej Battelino, MD, PhD,[9] Henk Veeze, MD, PhD,[10] and Thomas Danne, MD,[5,11] on Behalf of the SWEET Study Group

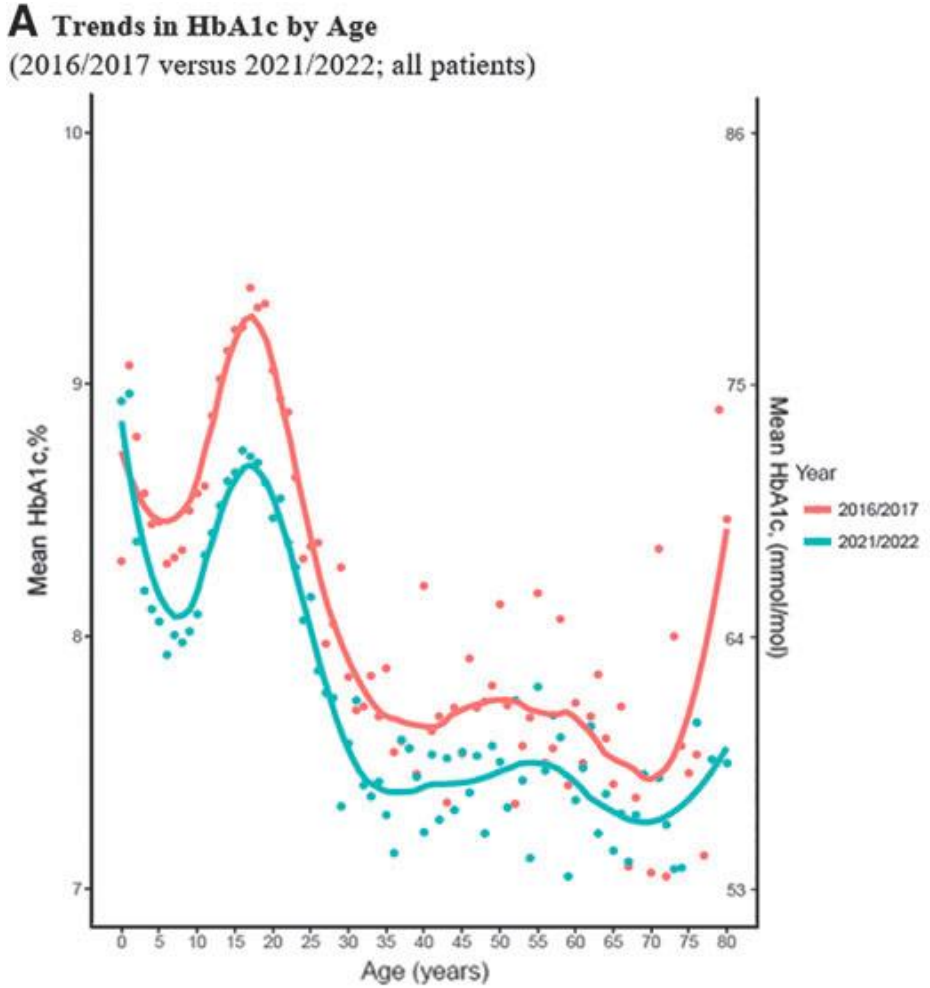


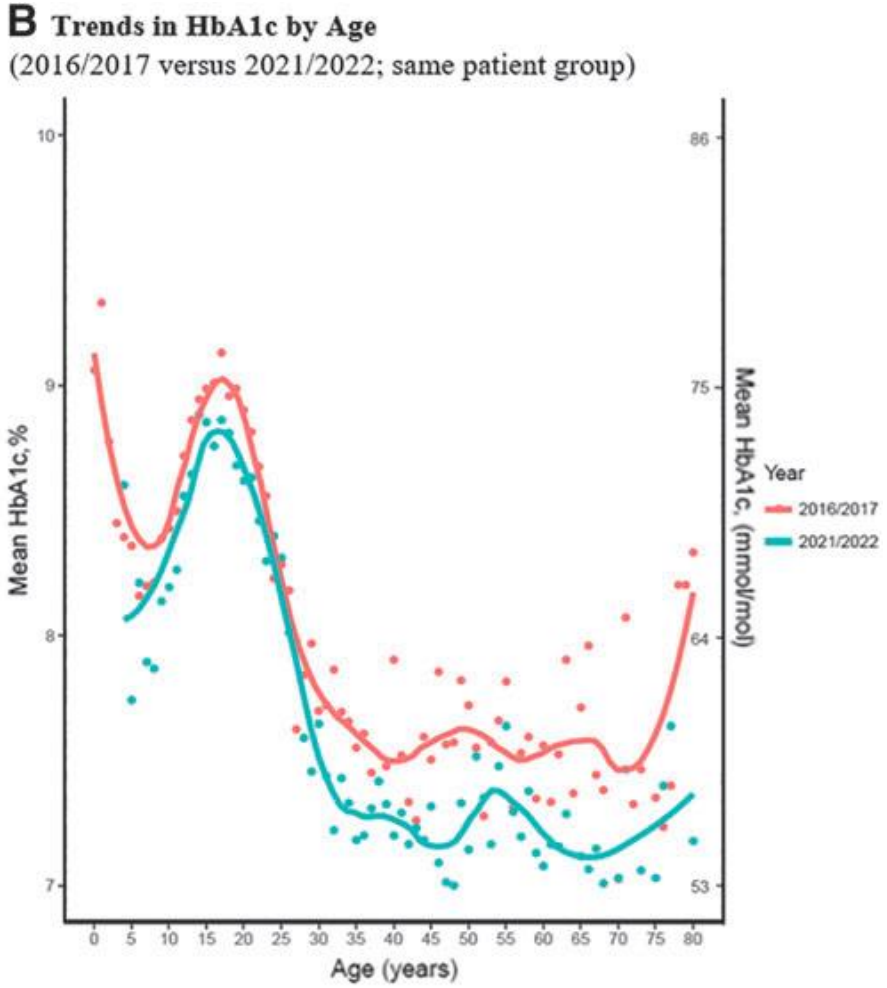


T1DX-QI network has grown!



Improvement in Mean A1c Across the Life Span





	2016 & 2017	2021 & 2022
N	27584	33070
Mean HbA1c (SD)	8.7 (1.9)	8.4 (2.1)
% with HbA1c <7% [N (%)]	5416 (20)	8557 (26)
% with HBA1c >9% [N (%)]	11811 (43)	10169 (31)
p-value		p-value <0.01

	2016 & 2017	2021 & 2022
N	9579	9579
Mean HbA1c (SD)	8.5 (1.7)	8.4 (1.9)
% with HbA1c <7% [N (%)]	2032 (21)	2507 (26)
% with HBA1c >9% [N (%)]	3524 (37)	3200 (33)
p-value		p-value <0.01

Ebekozien, DTT 2023

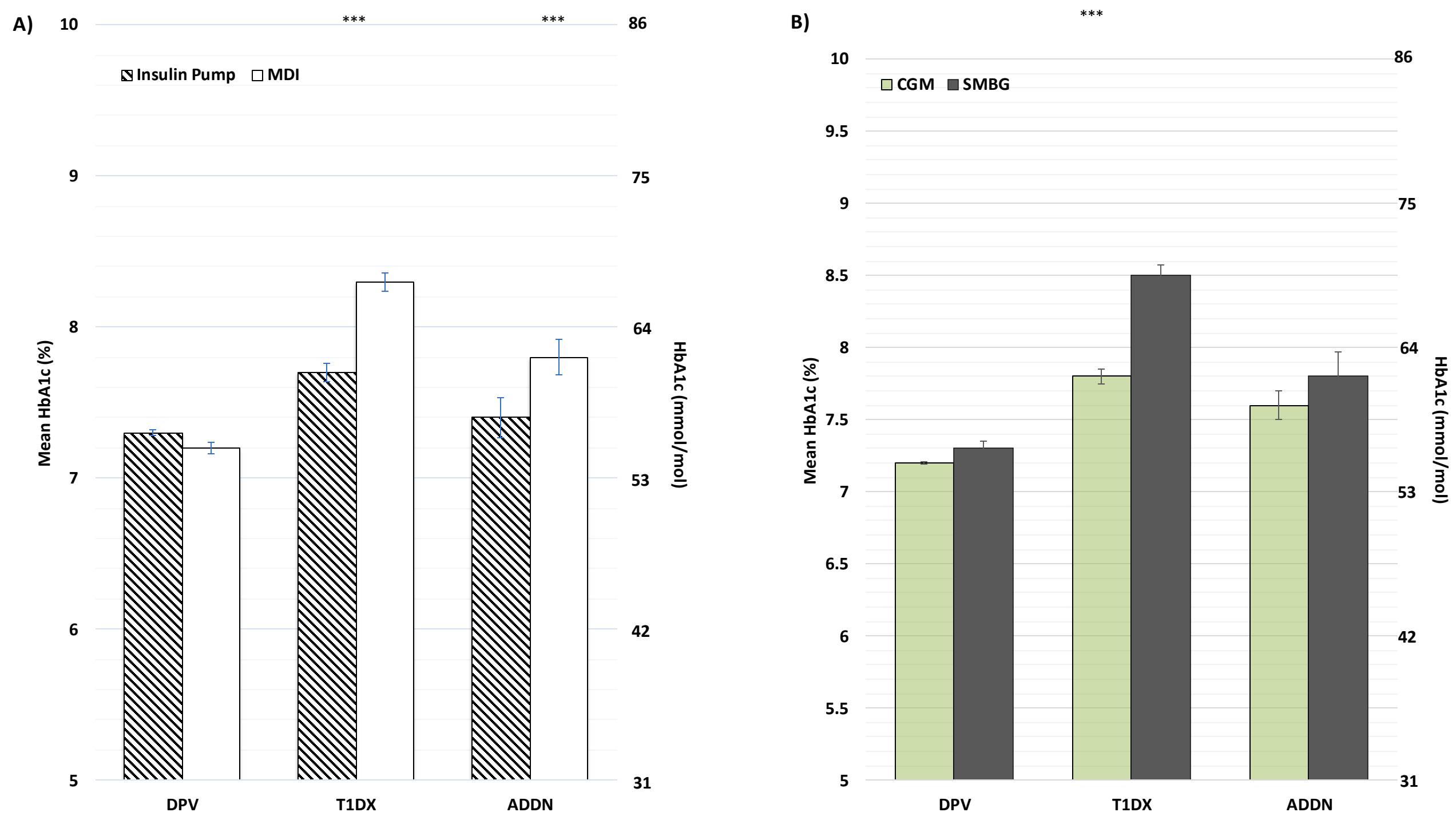
0.3% improvement from 2016/17→2021/22

Demographic, clinical, management and outcome characteristics of 8,004 young children with type 1 diabetes: a vulnerable group in need of specialized healthcare.

In review, Sandy et al, 2023

	ADDN (n= 954)	T1DX-QI (n=1,831)	DPV (n=5,219)	P value
Age at assessment	4.9 ± 1.2	4.4 ± 1.0	4.6 ± 1.2	<0.001
% Insulin Pump	39.2	46.6	86.6	<0.001
% CGM	70.5	57.6	85.1	<0.001
% hybrid closed loop	0.5	3.6	6.9	<0.001
HbA1c [%]	7.7 ± 1.2	8.0 ± 1.4	7.3 ± 0.9	<0.001

- Since 2010-12 to now:
  - DPV 7.4 → 7.3%
  - T1DX 8.2 → 8.0%


A)
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Insulin Pump
MDI
Mean HbA1c (%)
HbA1c (mmol/mol)
10
9
8
7
6
5
86
75
64
53
42
31
DPV
T1DX
ADDN
B)
***
CGM
SMBG
Mean HbA1c (%)
HbA1c (mmol/mol)
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
86
75
64
53
42
31
DPV
T1DX
ADDN

Future Directions

- Desire by other registries for continued collaboration
- Difficult to find funding
- T1DX –QI
  - Process to propose new research topics
  - Biostatistical support
  - Data sharing agreement: future possibility?
- Other ideas?

50th Annual Conference

ISPAD 2024

LISBON, PORTUGAL | OCTOBER 16-19

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October 16 – 19, 2024
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Inclusion & Innovation in Pediatric and Adolescent Diabetes

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www.stanfordchildrens.org/en/service/endocrinology

http://med.stanford.edu/pedsendo.html