The Design of the Electronic Health Record in Type 1 Diabetes Centers: Implications for Metrics and Data Availability for a Quality Collaborative

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Background/Objective

- The optimal design of the Electronic Health Record (EHR) is critical for ensuring the quality and reliability to capture data and improve care and outcomes.
- We sought to describe EHR tools and workflows which contribute to core quality metrics in the TIDX-QI.

Methods

- We conducted interviews over Zoom with QI representatives at thirteen T1DX-QI centers about their EHR tools and clinic workflows.
- Center shared screenshots of their tools/interfaces used to capture and contribute to 15 core data elements.

Results

- 12 pediatric and one adult center provided screenshots and engaged in interviews
- All centers used structured data tools (10 using EPIC, 3 using Cerner)
- Number of available metrics per center ranged from 4 to 15 at each site
- Most centers had information about glycemic outcomes and diabetes technology use
- Fewer centers had additional information about self-management behaviors
- Other metrics reported included: social determinants of health (n=9), depression (n=11) transition to adult care (n=7) and diabetes distress (n=3)
- Factors that contributed to the variability in data collection included: questions used for structured data elements, tool availability, workflows, stakeholders responsible for capturing data pediatric and one adult center provided screenshots and engaged in interviews

Figure 1: The Number of Centers/Centers with Structured Electronic Health Record Data Elements, by Domain and Metric
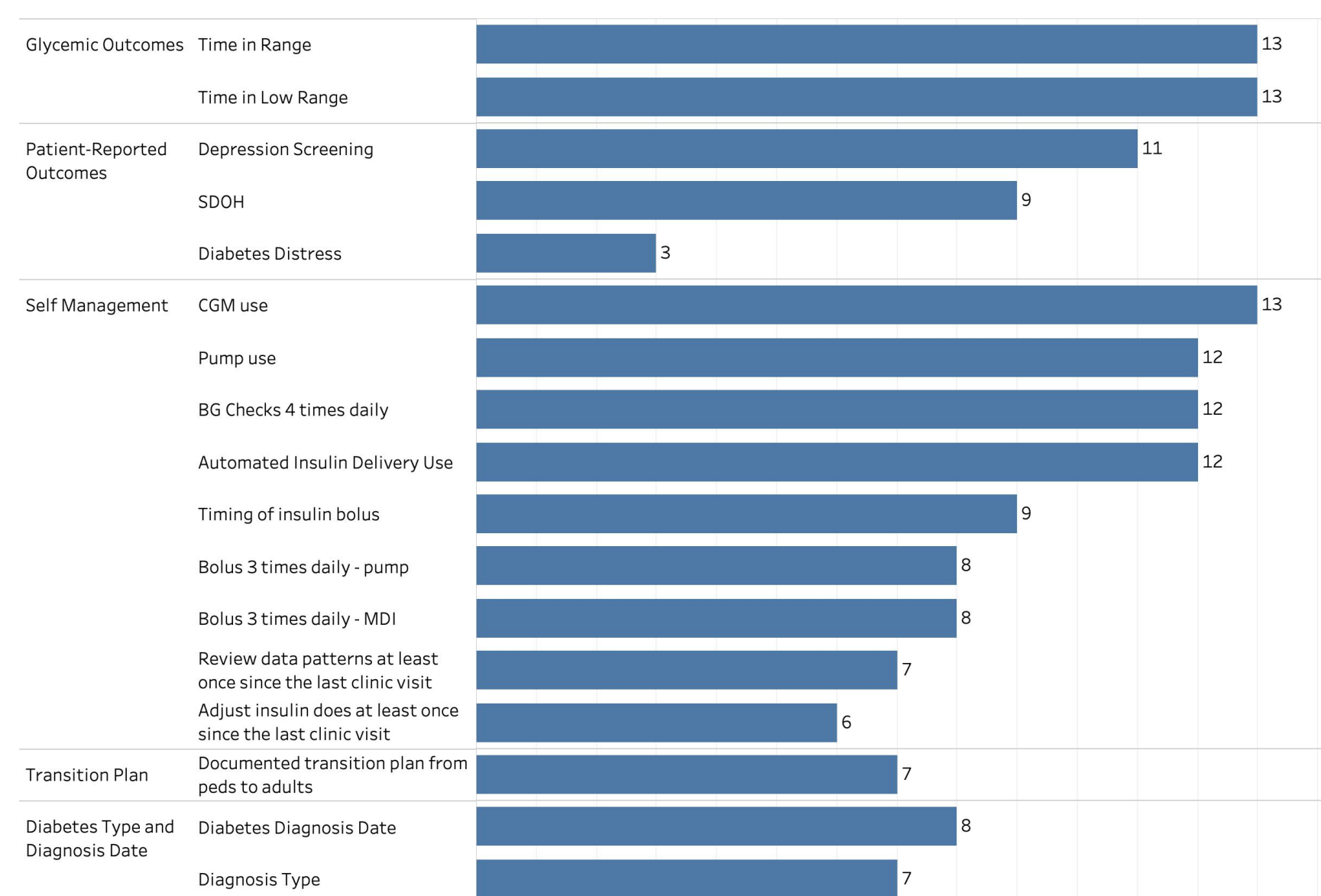

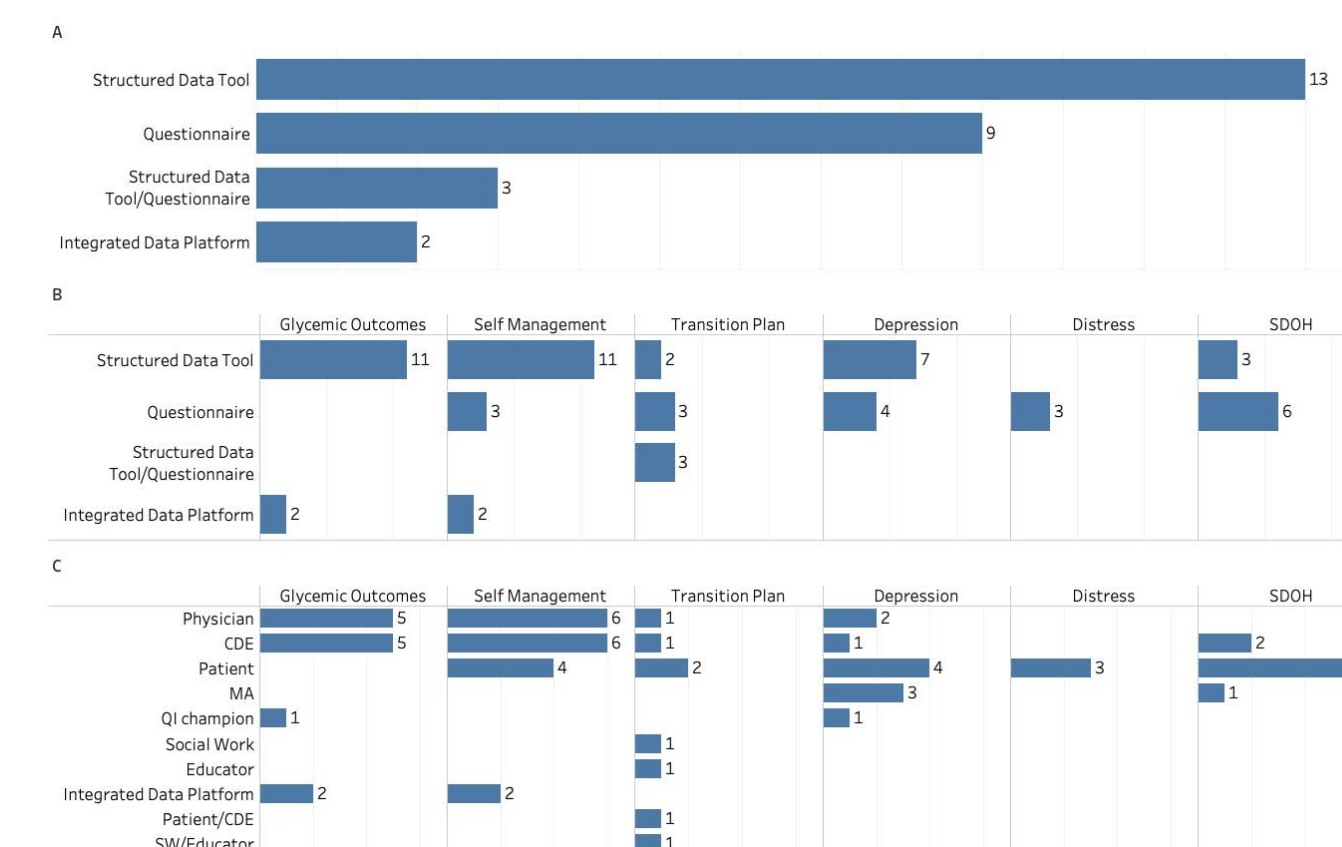Figure 2: Number of Centers with Different Electronic Health Record Tools

Table: Center level table, listed in descending order of the number of data elements available for each center that ideally should be captured at regular intervals and therefore excludes the diabetes type and date of diagnoses metrics, since those would typically only need to captured once. The next set of columns shows the types of EHR tools available (automated data tool, provider tools, or patient questionnaires), clinic workflows, and the different types of stakeholders who input data into the EHR.

Site	Data Elements	EHR Tools			Clinic Workflow	Individual who Inputs Data					Data Capture Frequency
		Automated Data Tools	Structured Data Tool	Questionnaire		Educator /Nurse	Provider	Patient	Social Work	QI champion	
A	15		•	•	Paired	•	•	•			Each Visit
B	15		•	•	Paired	•	•				Each Visit
C	14		•	•	Paired	•	•	•	•		Each Visit
D	14		•	•	Paired	•	•				Each Visit
E	14		•	•	Provider only	•	•				Each Visit
F	13		•	•	Paired	•	•	•		•	Each Visit
G	10		•	•	Paired	•	•				Each Visit
H	10		•	•	Provider only	•	•				Each Visit
I	10		•	•	Paired	•	•	•			Each Visit
J	10	•	•		Paired						Each Visit
K	8		•	•	Provider only	•	•			•	Each Visit
L	6		•	•	Provider alone	•	•				Each Visit
M	4		•	•	Provider only	•	•				At Education Visits

Limitations

- We did not talk to all centers but rather a convenience sample of centers in the T1DX-QI, who may be skewed to those with more Health IT capacity in the system; however the wide variation in the availability of tools and metrics in this group was still notable.
- We did not do video capture or electronic capture of workflows due to privacy concerns and therefore had to rely on screenshots and narrative description of workflows which may not generalize to all providers at the local site.
- We did not evaluate data quality but focused on data availability at centers.

Conclusion

- Systematic and comprehensive data acquisition from the EHR to capture information about overall processes and outcomes of care for diabetes is critical for quality improvement.
- The current design of EHR tools in terms of metric specification, tool design, and integration into workflows is variable, lacks standardization, and poses barriers for provider adoption and data availability.
- Further work is needed to address standardization in EHR data elements, tools and workflows, to support measurement and subsequently improved quality of care and outcomes of individuals with T1D.