

### **Validating QcDMui with a published tool**

Figure S1 is a screenshot of the configuration specified in QcDMui when analysing a test data set used by a published tool [1] by using the same cut-off values and exclusion criterion applied to the test data by the published tool to generate a glucometrics report (see Figure S2). Figure S3 is the resulting glucometrics report generated from QcDMui.

After excluding patient stays in the test data set that have less than 2 blood glucose (BG) measurements, the QcDMui reported the same number of patient-samples, patient-days and patient-stays as the published tool (indicated by a red rectangle in Figure S2 and S3). By specifying 300 mg/dL as the cut-off value for severe hyperglycaemia (indicated by orange rectangles in Figure S2 and S3), 70 mg/dL and 40 mg/dL as the cut-off values for moderate and severe hypoglycaemia (indicated by green rectangles in Figure S2 and S3), and 70 mg/dL and 180 mg/dL as the cut-off values for the target range of BG levels (indicated by the blue rectangles in Figure S2 and S3), both tools generated the same information, suggesting the QcDMui was able to reproduce the statistics reported by the published tool concerning adverse events (i.e., hyperglycaemia and hypoglycaemia) and the target range.

**Figure S1.** A screenshot of the specifications applied to QcDMui that corresponded to the cut-off values and exclusion criterion used to generate a glucometrics report by a published tool [1].

QcDM UI
About the interface
Data
Glucometrics
License

Data folder  
  
Confirm data folder

Hypo cutoff  
Please specify the first hypo cutoff (mg/dL):

Hyper cutoff  
Please specify the first hyper cutoff (mg/dL):

Target range  
Please specify the lower value of the target range (mg/dL):

Hyperglycemia index (HGI)  
Please specify the cutoff for HGI (mg/dL):

Please specify the second hypo cutoff (mg/dL):

Please specify the second hyper cutoff (mg/dL):

Please specify the lower value of the target range (mg/dL):

Please specify the third hypo cutoff (mg/dL):

Please specify the third hyper cutoff (mg/dL):

Exclusion criteria  
☒ Exclude patient stays having fewer BG measurements than the number specified below  
  
☐ Exclude patient stays having length of stay less than or equal to the number specified below in terms of hours

After selecting the right data folder and parameters, please click on 'Confirm' button below before proceeding to the panel on the right.  
Confirm  
No file is found in folder 'data\_new' in selected data folder.

Time range:  
From  
Year  
  
Month  
  
To  
Year  
  
Month  
  
Confirm time range

Wards  
☒ All wards with data in the selected time range ☐ Selected wards  
Confirm choice  
Confirm ward

Number of unique patients in each selected ward and month:  
Show  entries Search:   

	Wards	Mar 2005	Apr 2005
1	A	27	54

Showing 1 to 1 of 1 entries Previous  Next

**Figure S2.** A screenshot of a glucometrics report by a published tool [1] when applied to a test data set.

File: test1 Computed on: Thursday, March 24, 2011 at 11:54:25

## Glucometrics

http://metrics.med.yale.edu Yale Center for Medical Informatics & the Yale School of Medicine, Section of Endocrinology

Institution: 123 Ward: CV Ward type: Adult Thoracic Surgery Coronary Care Unit  
 Glucose type: poc Patient subgroup: none  
 3.23.2005 to 4.21.2005

	Patient - samples		Patient - stays (means)		Patient - days (means)	
number	2444		60		298	
median	125		132		131	
mean	134		140		139	
5 th-95th percentile	78-230		102-196		97-219	
spread	152		93		121	
<b>Adverse events</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
at least one glucose < 40	6	0.2	4	6.7	6	2.0
at least one glucose < 70	74	3.0	18	30.0	45	15.1
at least one glucose ≥ 300	28	1.1	8	13.3	17	5.7
<b>Target range</b>						
70 ≤ glucose < 180	2044	83.6	52	86.7	263	88.3
<b>Other ranges</b>						
70 ≤ glucose < 110	708	29.0	4	6.7	53	17.8
110 ≤ glucose < 140	831	34.0	31	51.7	142	47.7
140 ≤ glucose < 180	505	20.7	17	28.3	68	22.8
180 ≤ glucose < 240	226	9.2	8	13.3	26	8.7
240 ≤ glucose < 300	72	2.9	0	0.0	6	2.0
110 ≤ glucose < 180	1336	54.7	48	80.0	210	70.5
70 ≤ glucose < 240	2270	92.9	60	100.0	289	97.0

**Note:** Rectangles in the same colour in Figure S2 and S3 indicate the same statistics reported from the QcDMui and the published tool.

**Figure S3.** A screenshot of a glucometrics report by QcDMui when analysing a test data set used by a published tool [1].

Data Summary

Summary of BG measurements

	Summary
Total (N)	2456
Minimum (mg/dL)	11
5-th percentile (mg/dL)	78
25-th percentile (mg/dL)	104
75-th percentile (mg/dL)	153
95-th percentile (mg/dL)	230
Maximum (mg/dL)	453
Non-numeric values (N)	0

Exclusion Summary

Total number of patient-stays	72
Number of patient-stays excluded with	Count (%)
No less than 2 glucose readings during hospital stay	12 (16.7)

Note that these criteria are not mutually exclusive.

Glucometrics

Summary

Location	A
Period	23 Mar 2005 to 21 Apr 2005

	Patient-sample	Patient-day <sup>#1</sup>	Patient-stay <sup>#2</sup>
Count	2444	298	60

GLYCEMIC CONTROL

Hyperglycemia

Percent with glucose $\geq 180$ mg/dL	326 (13.3%)	121 (40.6%)	37 (61.7%)
Percent with glucose $\geq 250$ mg/dL	82 (3.4%)	40 (13.4%)	19 (31.7%)
Percent with glucose $\geq 300$ mg/dL	28 (1.1%)	17 (5.7%)	8 (13.3%)
Hyperglycemia index (HGI): AUC ( $> 180$ mg/dL)/LOS (in hours)*			

Median (IQR)

0 (3)

Mean (SD)

7 (17)

Other metrics

Percent with glucose $\geq 70$ and $< 180$ mg/dL	2044 (83.6%)	263 (88.3%)	52 (86.7%)
Glucose (mg/dL)*			

Median (IQR)

125 (34)

131 (36)

132 (32)

Mean (SD)

134 (31)

139 (40)

140 (29)

Average patient-day mean glucose for a patient-stay (mg/dL)\*

Median (IQR)

135 (34)

Mean (SD)

142 (31)

HYPOGLYCEMIA

Percent with glucose $< 70$ mg/dL	74 (3%)	45 (15.1%)	18 (30%)
Percent with glucose $< 60$ mg/dL	34 (1.4%)	23 (7.7%)	14 (23.3%)
Percent with glucose $< 40$ mg/dL	6 (0.2%)	6 (2%)	4 (6.7%)

Percent of patient-stays with a recurrent hypoglycemia ( $< 70$  mg/dL) day (10-240 mins)

0 (0%)

GLYCEMIC VARIABILITY

Standard deviation: SD (mg/dL)<sup>2\*</sup>

Median (IQR)

25 (24)

30 (30)

Mean (SD)

31 (21)

36 (23)

J-index (mg/dL)<sup>2\*</sup>

Median (IQR)

25 (18)

27 (19)

Mean (SD)

32 (24)

33 (18)

\*:The summary statistics of the glucometrics for patient-day means and patient-stay means.

#1: 45 (15.1%) patient-days were removed for calculation of patient-day SD and J-index.

#2: 0 (0%) patient-stays were removed for calculation of patient-stay SD and J-index.

**Note:** Rectangles in the same colour in Figure S2 and S3 indicate the same statistics reported from the QcDMui and the published tool.

#### Reference:

- 1 Thomas P, Inzucchi SE. An internet service supporting quality assessment of inpatient glycemic control. In: *Journal of Diabetes Science and Technology*. SAGE Publications Inc. 2008. 402–8. doi:10.1177/193229680800200309