

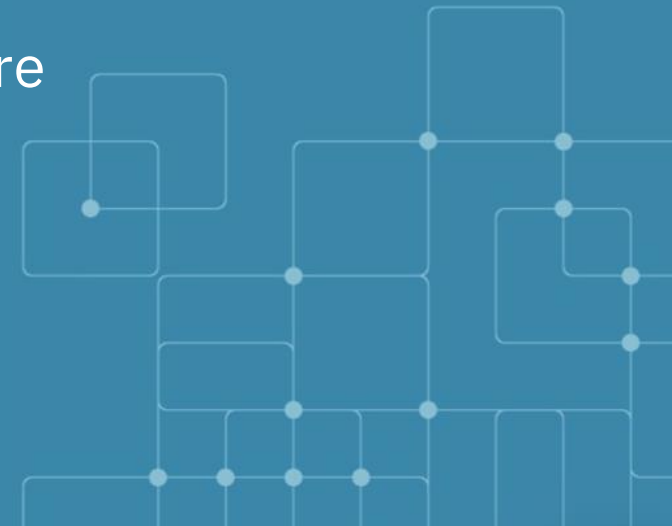
Dr. Soliman Fakeeh Hospital — Jeddah

Value-Based Healthcare & Population Health Management Committee

Measuring what matters to our patients

Case-mix adjustment of the PAID-5 diabetes distress score
Turning a patient-reported number into a fair, usable signal for care

6,916 patients • 11,929 questionnaires



Why we ask patients how they feel

A lab result tells us how the disease is doing. It does not tell us how the **person** is doing. Two patients with the same HbA1c can live completely different lives. Patient-reported outcome measures, or PROMs, capture that difference in the patient's own words.

1 – The patient's view becomes data

Feelings we can count

Worry, fear and exhaustion are real clinical problems. A validated questionnaire turns them into a number we can track over time, like blood pressure.

2 – This is what value means

Outcomes that matter to patients

Value-based healthcare defines value as the outcomes that matter to patients for the resources we use. If we never measure those outcomes, we cannot manage value.

3 – A number we can act on

A trigger, not a statistic

A high distress score is a reason to talk, to refer, to simplify a regimen. The measurement only has value if it changes the next consultation.

The PROM we use: the PAID-5

Five questions about living with diabetes. The patient marks each one from **0 = not a problem** to **4 = serious problem**.

#	What we ask the patient about	Average score
1	Coping with the complications of diabetes	0.74
2	Diabetes taking up too much mental and physical energy every day	0.75
3	Feeling depressed when thinking about living with diabetes	0.51
4	Feeling scared when thinking about living with diabetes	0.58
5	Worrying about the future and the possibility of serious complications	0.87

Question 5 scores highest. Fear of the future, not today's symptoms, is what weighs on our patients most. Averages from the 11,929 complete questionnaires.

How it is scored

Add the five answers. The total runs from **0 to 20**. Higher means more distress.

The line that matters

8 or more

The published screening cut-off for likely diabetes-related distress. At or above it, the patient needs a conversation.

The clinical picture we place beside it

The PAID-5 on its own is one voice. We crossed every questionnaire with the clinical and demographic values already recorded for that patient in the hospital system, so the patient's experience and the patient's biology are read together.

CLINICIAN AND LABORATORY RECORDED

- **HbA1c** — glycaemic control
- **Body mass index**
- **Systolic blood pressure**
- **Diastolic blood pressure**

Measured values from the record, not asked of the patient.

PATIENT AND CONDITION FACTORS

- **Age**
- **Sex**
- **Cancer**
- **Autoimmune**

Things the clinic cannot change, which still shape the score.

ONE PATIENT, ONE RECORD

Every value was read from the **same patient record** as the questionnaire.

Nothing was estimated, averaged or filled in. Where a value was missing the record was set aside, not guessed.

Where the numbers come from

Everything exported for adult DSFH Jeddah patients

17,159 questionnaires · 10,441 patients

All five questions answered

17,119 questionnaires · 10,426 patients

Diabetes recorded in the export

15,668 questionnaires · 9,255 patients

Clinical values only

15,638 questionnaires · 9,232 patients

Complete clinical record — the cohort we analysed

11,929 questionnaires · 6,916 patients

What we lost, and why

3,645 missing HbA1c

173 missing BMI

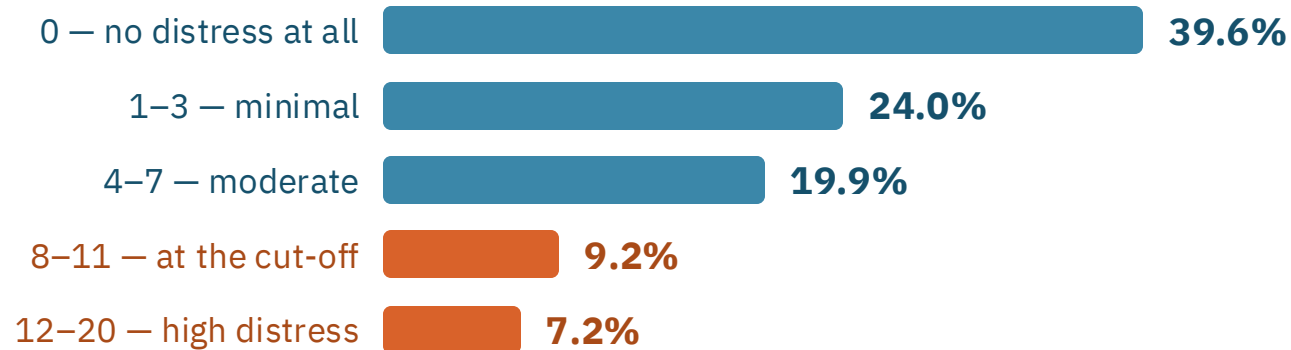
11 missing blood pressure

One missing lab value explains almost the whole loss.

One patient, one vote

Some patients answered up to 11 times. Each patient carries a total weight of one, so frequent attenders cannot dominate a clinic's average.

What our patients told us



The bar length is the share of patients in each band. Most of our patients are coping. A clear minority is not, and the two orange bars are the patients the clinic needs to find.

16.5%

of our diabetic patients scored **8 or more**, at or above the screening cut-off for likely diabetes distress

Average score

3.45 out of 20 across the cohort. A low average hides the group that matters, which is why we look at the cut-off as well as the mean.

Why a raw score is not a fair score

Patients are not distributed evenly across our clinics. One clinic sees younger patients with poorer control; another sees stable, older patients. Compare their raw averages and you are mostly comparing **who walked through the door**, not the care that was given.

If we don't adjust

We blame the wrong clinic

A team doing good work with difficult patients looks like a team doing poor work. An improvement plan gets written for a problem that was never theirs.

If we don't adjust

We miss a real problem

A clinic with easy patients can look fine while genuinely underperforming. Favourable case mix hides it, and nobody goes looking.

If we don't adjust

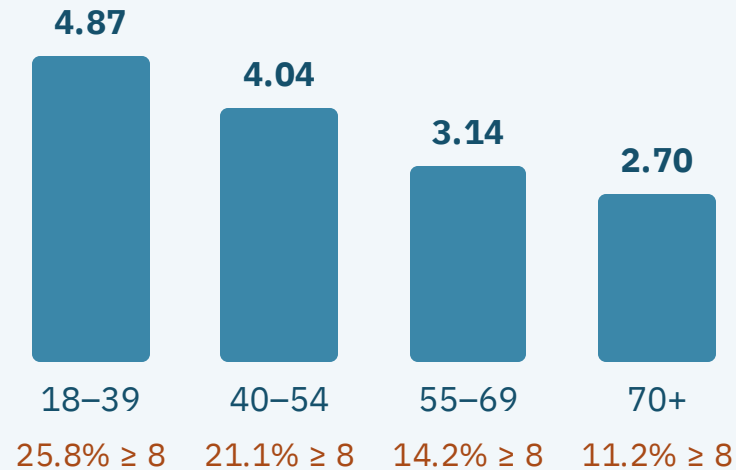
We punish taking hard cases

The most damaging outcome. If complex patients lower your score, the quiet incentive is to avoid them. Adjustment removes that incentive.

Case-mix adjustment answers one question: **given the patients this clinic actually treats, is the result better or worse than we would expect?**

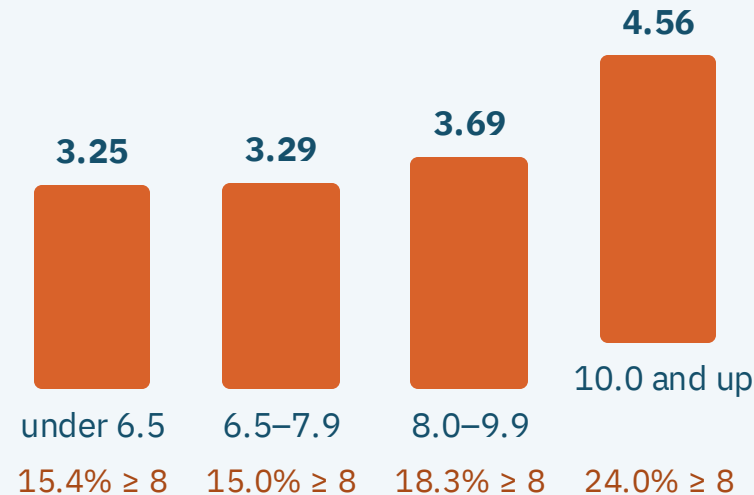
Who carries more distress

Younger patients, more distress



Bar height is the average PAID-5 score. A patient in their thirties reports roughly twice the rate of significant distress as a patient over seventy.

Worse control, more distress



Bar height is the average PAID-5 score by HbA1c band. Distress rises sharply once control is lost — the mind and the metabolism move together.

What the model confirms

Each 10 years younger

+0.58 points

Women compared with men

+0.43 points

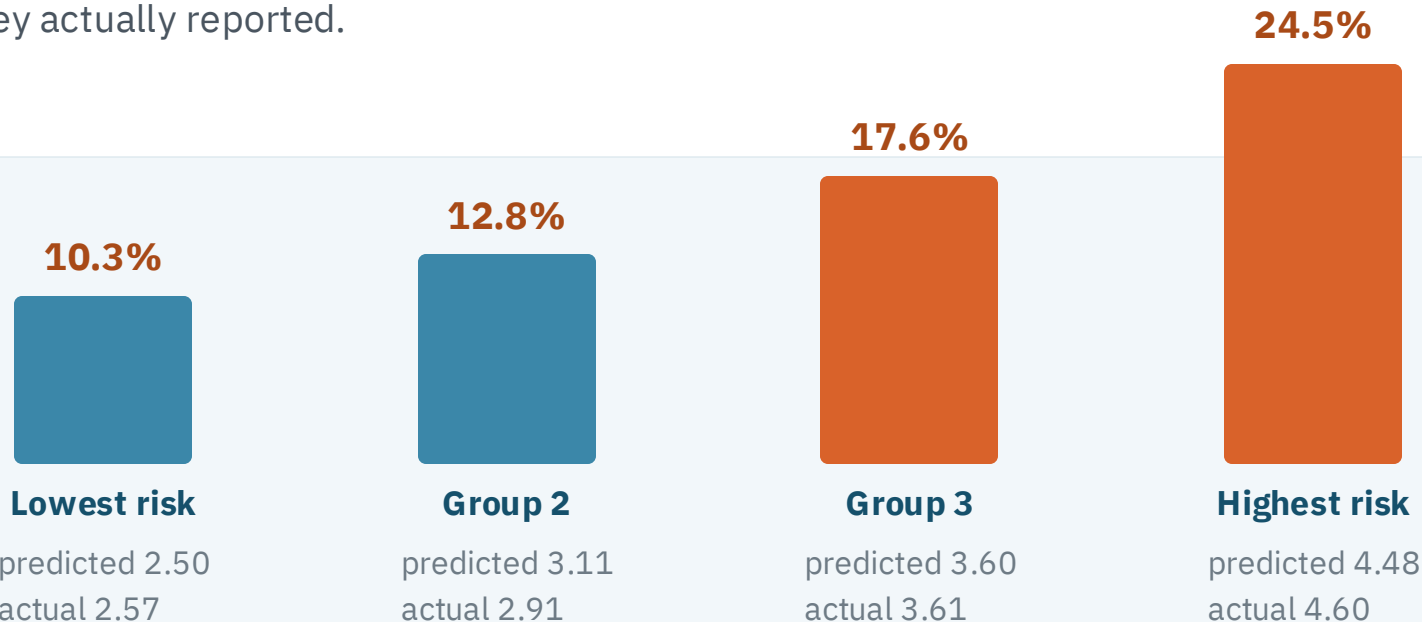
Each 1 point higher HbA1c

+0.23 points

All three are statistically clear. BMI, blood pressure, cancer and autoimmune disease were not. Bars start at zero.

Risk stratification: does the model find the right patients?

We asked the model to predict a distress score for every patient from age, sex, HbA1c, BMI, blood pressure and comorbidity alone — **without seeing the answers**. Then we sorted patients into four equal groups by that prediction and looked at what they actually reported.



Bar height is the share of patients who actually scored **8 or more**. It climbs steadily from one group to the next, and the predicted and actual averages beneath each bar track each other closely. Four equal groups of 1,733 to 1,921 patients.

What this means

A patient in the highest-risk quarter is **nearly two and a half times** as likely to be in real distress as one in the lowest — 24.5% against 10.3%.

And what it does not mean

It cannot tell you which individual patient is distressed. Within every group, most patients are fine. Stratification points the screening effort; the questionnaire still does the finding.

How the adjustment works

OBSERVED

What this clinic's patients actually reported

—

EXPECTED

What patients like theirs report across the hospital

+

HOSPITAL AVERAGE

3.45 — the common yardstick for everyone

=

ADJUSTED

The fair, like-for-like number we compare

Worked example — General Internal Medicine

Step	Points
What its 1,625 patients reported	3.662
What patients like theirs report	– 3.377
Hospital average added back	+ 3.451
Adjusted score	3.735

Its patients were predicted to be **less** distressed than average, yet reported more. After adjustment the department sits further above the line, not below it.

The arithmetic always balances

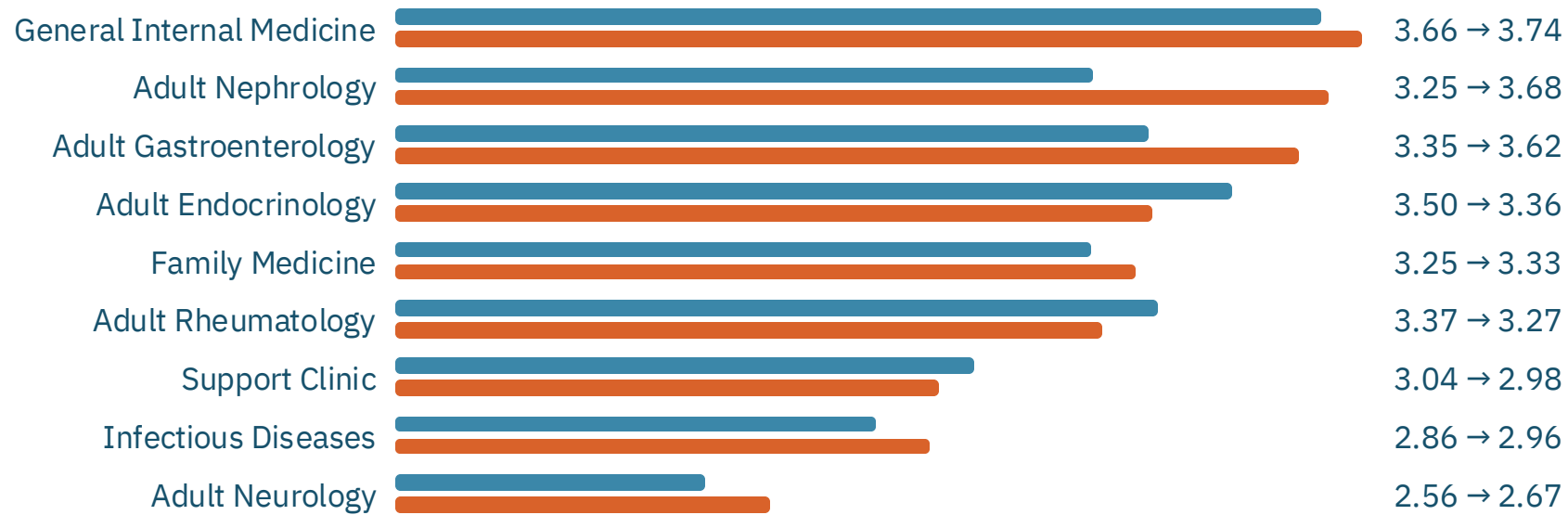
Across the whole hospital, observed, expected and adjusted are identical at 3.45. Adjustment moves distress **between** departments; it never invents or removes any.

How sure are we?

Every department's range was built by re-drawing the patient list 1,000 times and refitting the model each time, so the uncertainty shown includes the model's own.

Nine departments, before and after adjustment

■ Observed — what was reported ■ Adjusted — like-for-like Hospital average 3.45 · scale begins at 2.0 points



Adjustment changes the picture. **Nephrology moves from fifth to second** once the ease of its case mix is accounted for; **Endocrinology moves from second to fourth** because it carries the most difficult patients. Each department shown has at least 30 patients — a reporting threshold we chose, not one the survey requires. 95% ranges are in the supporting workbook, sheet 5.