National Diabetes Inpatient Safety Audit 2018-2021

England and Wales

14 July 2022

An annual survey of GIRFT recommended staffing, systems and pathways

Results and findings

Contents

Key details:

This report covers:

a) the provision of inpatient services in England and Wales on 1 October 2021; and

b) diabetes-specific inpatient harms in England between 1 May 2018 and 31 October 2021.

Acronyms: The following acronyms and abbreviations are used throughout the report:

BG = Blood glucose
DKA = Diabetic ketoacidosis
DFU = Diabetic foot ulcer
eGFR = Estimated glomerular filtration rate
GIRFT = Getting It Right First Time
HES = Hospital Episode Statistics
HHS = Hyperosmolar hyperglycaemic state
ISS = Integrated Specialist Services Structures Survey
LHB = Local health board
LOS = Length of stay
MDiT = Multi-disciplinary diabetes inpatient team
NaDIA = National Diabetes Inpatient Audit
NDISA = National Diabetes Inpatient Safety Audit
NDA = National Diabetes Audit
NICE = The National Institute for Health and Care Excellence
RRT = Renal replacement therapy

1. Executive summary

1. Executive summary:
Key findings: Inpatient service provision

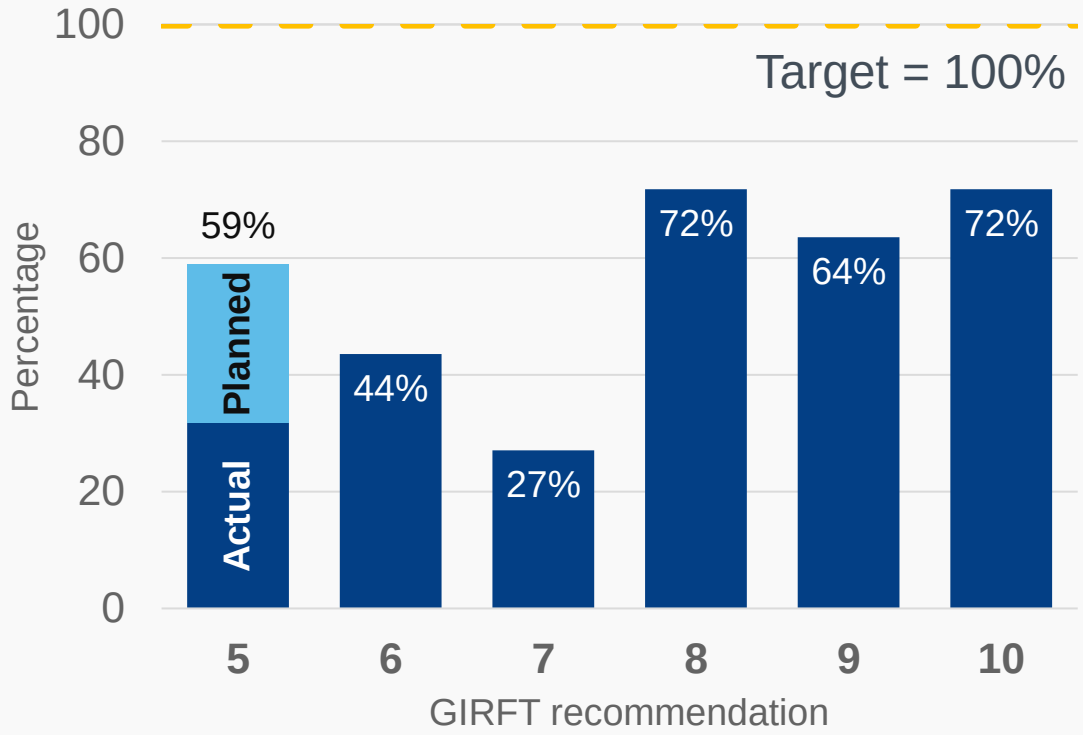
The National Diabetes Inpatient Safety Audit (NDISA) reviewed inpatient service provision in England and Wales against the 2020 Diabetes Getting It Right First Time (GIRFT) recommendations.

6 inpatient-specific GIRFT recommendations were assessed for this report. The proportion of healthcare providers meeting each GIRFT recommendation can be seen in Chart 1.1 (right).

Findings: Service coverage ranged from:

- **72%** of healthcare providers providing insulin training for appropriate staff [GIRFT recommendation 8]; and **72%** having a self-management policy [GIRFT recommendation 10]; to
- Only **27%** of providers having a system to identify people with diabetes on admission, prioritising those at highest risk, involving networked blood glucose (BG) meters [GIRFT recommendation 7]

Chart 1.1: Percentage of responders that fully met each GIRFT recommendation[1], England and Wales, October 2021



GIRFT recommendations: The full text of each GIRFT recommendation is on the associated slide later in the report. Brief descriptions of the GIRFT recommendations are below: **5**. Dedicated multi-disciplinary inpatient diabetes teams (MDiTs): provision and weekend cover (actual or planned) (slide 14). **6**. Dedicated MDiTs: meeting and reporting (slide 15). **7**. Identifying diabetes on admission and ensuring rapid referral (slide 16). **8** Reducing insulin errors (slide 17). **9**. Improving care through perioperative pathways (slide 17). **10**. Supporting self-management in hospital (slide 17).

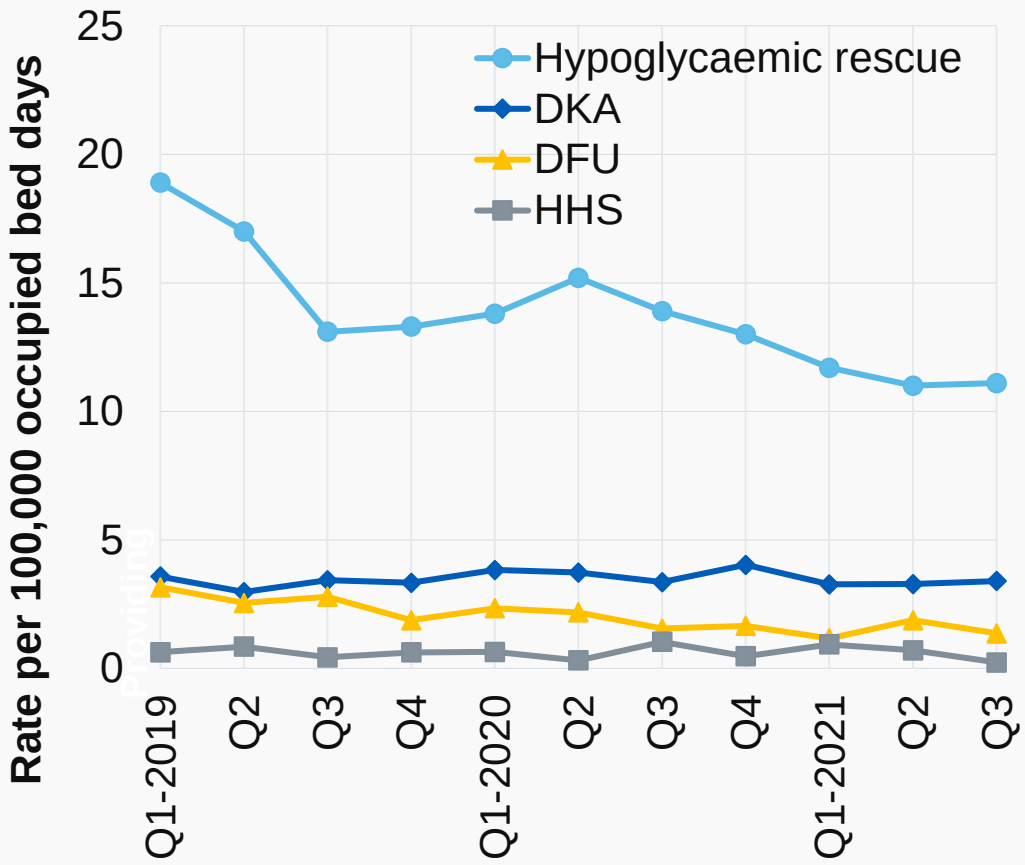
1. Executive summary:
Key findings: Inpatient harms

NDISA has reviewed the rate of 4 life-threatening diabetes-specific inpatient harms that occurred due to errors of inpatient diabetes management in England between Q1 2019 (Jan-Mar) and Q3 2021 (Jul-Sep): inpatient onset of hypoglycaemia requiring rescue, diabetic ketoacidosis (DKA), hyperosmolar hyper-glycaemic state (HHS) and diabetic foot ulcer (DFU).

Findings: The rate of total inpatient harms decreased by almost 40% from 26.3 per 100,000 occupied bed days in Q1 2019 (Jan-Mar) to 16.2 in Q3 2021 (Jul-Sep) (see Chart 4.2). Chart 1.2 (right) shows that this trend is largely driven by reductions in hypoglycaemic rescue (from 18.9 to 11.1), which comprise 69% of total inpatient harms. There was also a small peak in Q2 2020 (Apr-Jun) of 15.2, coinciding with wave 1 of the COVID-19 pandemic.

Although the DFU rate follows a similar downward trend (3.2 to 1.4), there was no apparent reduction in the rate of inpatient DKA or HHS.

Chart 1.2: Inpatients with diabetes, by quarter: rate of inpatient harms: hypoglycaemic rescue, DKA, DFU and HHS, England, January 2019 - September 2021 (rounded[1])



Notes: 1. Proportions are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5

1. Executive summary:
NDISA recommendations (1)

NDISA recommendation 1: **All NHS Trusts in England and LHBs (Local Health Boards) in Wales should participate in NDISA data collection.**

Why? NDISA is a mandatory national audit. Participating in data collection allows healthcare providers to check compliance with GIRFT recommendations, to monitor adverse inpatient diabetes outcomes and to benchmark against their peers. This allows them to understand their current position and identify areas for improvement.

What the audit tells us: Of 126 organisations eligible for NDISA, 85 (67%) responded to the specialist services structures survey and 109 (87%) have at some time submitted harms data with 63 (50%) submitting data regularly.

1. Executive summary:
NDISA recommendations (2)

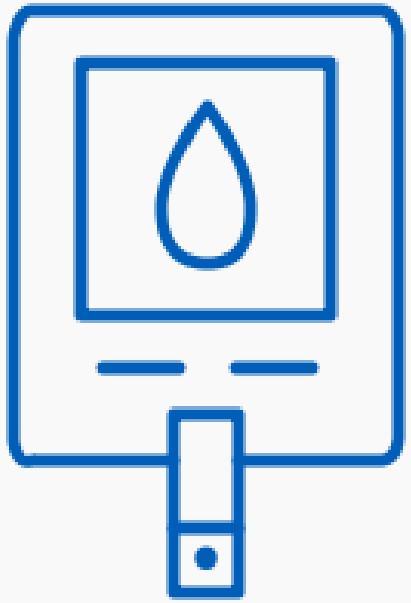
NDISA recommendation 2: **Healthcare providers, NHS trusts in England and LHBs in Wales, should have a multidisciplinary diabetes inpatient team (MDiT) and be working towards providing base-level diabetes cover at weekends**.

Why? The MDiT plays a central role in providing safe, effective inpatient diabetes care. For this reason, the NHS Long Term Plan (3.81), the 2019 National Diabetes Inpatient Audit (NaDIA) report (recommendation 3) and the 2020 GIRFT report (recommendation 5) have all previously made this recommendation.

What the audit tells us: 13% of healthcare providers still do not have an MDiT in spite of these recommendations (see Table 3.2). Only 32% of healthcare providers currently have both an MDiT in place and provide cover at weekends, a further 27% have an MDiT in place and are working towards weekend cover (Table 3.2).

1. Executive summary:
NDISA recommendations (3)

NDISA recommendation 3: **Healthcare providers should have networked BG meters to alert staff when recorded glucose levels are out-of-range (increased risk).**



Why? Networked BG meters can alert the MDiT to high and low BG readings when they occur, directing support to those most in need. They also allow audit and review of glucose readings, permitting ongoing review of the overall safety and effectiveness of inpatient diabetes care. This supports GIRFT recommendation 7.

What the audit tells us: Only 56% of healthcare providers have networked BG meters with a system to alert the diabetes team to out-of-range BG values (see Table 3.4).

1. Executive summary:
NDISA recommendations (4)

NDISA recommendation 4: **All participating organisations should have a policy to support diabetes self-management in hospital.**

Why? 17% of inpatients are people with diabetes. They are experts in self-management and often feel unsafe when handing over their diabetes management to others in hospital. The issue has been highlighted as of particular importance by people living with diabetes who are part of the NDISA advisory group.

What the audit tells us: 72% of responding organisations report having a self-management policy. For people with diabetes, it is a priority that these policies become universal and that they are promoted in line with GIRFT recommendation 10.

2. Introduction

2. Introduction: Overview

This is the 1st National Diabetes Inpatient Safety Audit (NDISA) report. NDISA has 2 core components:

1) A review of **inpatient service provision** in England and Wales, using the National Diabetes Audit (NDA) Integrated Specialist Services Structures Survey (ISSSS, abbreviated to ISS) undertaken in October 2021. Service provision is assessed against recommendations in the 2020 Diabetes Getting It Right First Time (GIRFT) report.
2) A review of the rates and risk factors for serious diabetes-specific **inpatient harms** in England only, using the NDISA harms collection, a mandatory year-round collection of 4 harms that can occur to inpatients with diabetes in acute hospitals in England. The data collection started on 1 May 2018. The collection was previously known as National Diabetes Inpatient Audit (NaDIA) – Harms.

NDISA is part of the NDA programme within the National Clinical Audit and Patient Outcomes Programme (NCAPOP), commissioned by the Healthcare Quality Improvement Partnership (HQIP) on behalf of NHS England and the Welsh Government.

Prepared in collaboration with:

HQIP Healthcare Quality Improvement Partnership

NHS Digital

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Supported by:

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3. Inpatient service provision

3. Inpatient service provision:
Background

The National Diabetes Inpatient Safety Audit (NDISA) looked at the provision of inpatient services using the Integrated Specialist Services Structures Survey (ISSSS, abbreviated to ISS), a National Diabetes Audit (NDA) questionnaire which asks healthcare providers whether they have put in place structures and systems of care for people with diabetes recommended by the Getting It Right First Time (GIRFT) programme. The ISS was distributed to healthcare providers in England and Wales in October 2021.

The inpatient section of the ISS is comprised of questions on 17 aspects of inpatient care delivery identified as important by the 2018 Diabetes UK report: Making Hospitals Safe for People with Diabetes. The results of 11 of the 17 ISS questions are included in this report, relating to 6 GIRFT recommendations.

Participation in ISS

96 providers responded to the ISS (see Table 3.1, right). This report includes data from the 85 ISS responders which provide acute inpatient medical care[1]: 82 NHS trusts in England and 3 local health boards in Wales (LHBs). There are 138 acute providers in England[2] and 7 in Wales[3], so the overall ISS response rate is 59% (85 of 145). Data from all 96 responders is provided in supporting documentation.

Table 3.1: Submitters to the ISS,
England and Wales, October 2021

Provider type	Total
Acute NHS trust	**82**
Other NHS trust	**10**
LHB	**3**
Independent healthcare provider	**1**
Total	**96**

Notes: **1**. Acute care includes active short-term hospital treatment for severe injury, illness, urgent medical conditions, or recovery from surgery. **2**. See NHS England: Urgent and Emergency Care Daily Situation Reports 2021-22. **3**. 7 local health boards: see https://www.wales.nhs.uk/nhswalesaboutus/structure

3. Inpatient service provision:
GIRFT recommendation 5: MDiT provision and cover

GIRFT recommendation 5:

All healthcare providers must have a dedicated multi-disciplinary team of specialist diabetes inpatient practitioners (MDiTs) as indicated in the NHS Long Term Plan (3.81). Healthcare providers should work towards providing base level specialist diabetes cover at weekends where this does not exist.

Table 3.2: Proportion of healthcare providers meeting GIRFT recommendation 5: Dedicated MDiTs: provision and weekend cover (actual or planned), England and Wales, October 2021

Question	Answered Yes
a) Does the provider have a dedicated multi-disciplinary team of specialist diabetes inpatient practitioners?	**87%** (74 of 85)
b) Is the provider providing base level specialist diabetes cover at weekends?	**32%** (27 of 85)
c) Is the provider working towards providing base level specialist diabetes cover at weekends?	**27%** (23 of 85)
Meeting GIRFT recommendation 5 (a and b or c)	**59%** (50 of 85)

Findings

Table 3.2 (left) shows that:

- **32%** (27 of 85 responders) had an MDiT team and already provide diabetes cover on weekends.
- A further **27%** (23 of 85) had an MDiT team and are planning to provide diabetes cover on weekends, making **59%** (50 of 85) in total.

3. Inpatient service provision:
GIRFT recommendation 6: MDiT meeting and reporting

GIRFT recommendation 6:

The MDiT should meet regularly to discuss day-to-day errors and safety issues, and report to a quarterly provider-level diabetes safety board which reviews the overall quality of the inpatient service, with support from IT, based on incident reporting, local and national audits of patient harms, diabetes medication errors, length of stay and readmissions.

Table 3.3: Proportion of healthcare providers meeting GIRFT recommendation 6:
Dedicated MDiTs: meeting and reporting, England and Wales, October 2021

Question	Answered Yes
a) Does the provider MDiT meet regularly to discuss day-to-day errors and safety issues?	**79%** (67 of 85)
b) Does the provider MDiT report to a quarterly trust-level diabetes safety board which reviews the overall quality of the inpatient service?	**45%** (38 of 85)
Meeting GIRFT recommendation 6 (both a and b)	**44%** (37 of 85)

Findings

Table 3.3 (left) shows that:

- **44%** (37 of 85) of responders fully met GIRFT recommendation 6.

3. Inpatient service provision:
GIRFT recommendation 7: Admission and rapid referral

GIRFT recommendation 7: All healthcare providers should have a robust system to identify all people with diabetes on admission to hospital, including emergencies and elective and non-elective surgery, and a triage system to identify those at risk and rapidly refer them to the diabetes team. This should be an electronic system, integrated with web-linked blood glucose (BG) meters which provide an alert system for staff when any out-of-range reading is recorded.

Table 3.4: Proportion of healthcare providers meeting GIRFT recommendation 7: Identifying diabetes on admission and ensuring rapid referral, England and Wales, October 2021

Question	Answered Yes
a) Does the provider have a robust system to identify all people with diabetes on admission to hospital, including emergencies and elective and non-elective surgery?	**51%** (43 of 85)
b) Does the provider have a triage system to identify those at risk and rapidly refer them to the diabetes team?	**71%** (60 of 85)
c) Does the provider have an electronic system, integrated with web-linked BG meters which provides an alert system for staff when any out-of-range reading is recorded?	**56%** (48 of 85)
Meeting GIRFT recommendation 7 (a, b and c)	**27%** (23 of 85)

Findings

Table 3.4 (left) shows that:

- **27%** (23 of 85) of responders fully met GIRFT recommendation 7.

3. Inpatient service provision:
GIRFT recommendations 8, 9 and 10

Table 3.5: Proportion of healthcare providers meeting GIRFT recommendations 8, 9 and 10:
Reducing insulin errors, improving care through perioperative pathways and supporting self-management in hospital**,**
England and Wales, October 2021

Question	Answered Yes
GIRFT recommendation 8: **Reducing insulin errors**: Training should be provided for every healthcare professional who dispenses, prescribes and/or administers insulin, appropriate to their level of responsibility, including an assessment of competency.	**72%** (61 of 85)
GIRFT recommendation 9: **Improving care through perioperative pathways**: All hospital trusts should have clear, audited perioperative pathways from pre-assessment through to discharge. These should be broadly in line with National Confidential Enquiry into Patient Outcome and Death (NCEPOD) recommendations.	**64%** (54 of 85)
GIRFT recommendation 10: **Supporting self-management in hospital** : All trusts should have and promote a self-management policy, which supports patients who want to self-manage their diabetes to safely do so while in hospital, as clinically appropriate and in line with wider NHS England (NHSE) and NHS Improvement (NHSI) policies on inpatient self-management (e.g. NHS Long Term Plan (3.79).	**72%** (61 of 85)

4. Inpatient harms: Trends

4. Inpatient harms: Trends

The NDISA harms collection

The National Diabetes Inpatient Safety Audit (NDISA) undertakes a continuous collection of 4 life-threatening diabetes-specific inpatient harms that occur due to errors of inpatient diabetes management. These events are distressing, slow-down recovery, may be life-threatening and should be preventable. The collection started on 1 May 2018 and was previously known as the National Diabetes Inpatient Audit (NaDIA) – Harms.

Hypoglycaemic rescue: A hypoglycaemic episode is a potentially dangerous drop in a patient's blood glucose (BG) to below 4.0 mmol/L. Severe hypoglycaemia requires **rescue treatment** because the patient is either unconscious, too confused to follow instruction or unable to swallow safely. Rescue treatment is applied using an injection of glucose or glucagon.

A hospital inpatient whose BG levels are optimally managed should only very rarely experience a severe hypoglycaemic episode requiring rescue treatment.

Diabetic ketoacidosis (DKA): DKA occurs (mainly in people with type 1 diabetes) when a severe lack of insulin means the body cannot use glucose for energy and the body starts to break down other body tissue, releasing ketones as an alternative energy source. This can lead to life threatening ketoacidosis if the levels are too high.

The development of DKA after admission suggests that the person's insulin treatment was omitted, or insufficient levels of insulin were provided, for an appreciable time. DKA is a potentially life-threatening emergency which should not develop in hospital.

Hyperosmolar hyperglycaemic state (HHS): HHS mainly occurs in people with type 2 diabetes who experience very high BG levels (often over 40mmol/L). It can develop over a course of days or weeks through a combination of illness (e.g. infection) and dehydration, and following high dose steroid therapy.

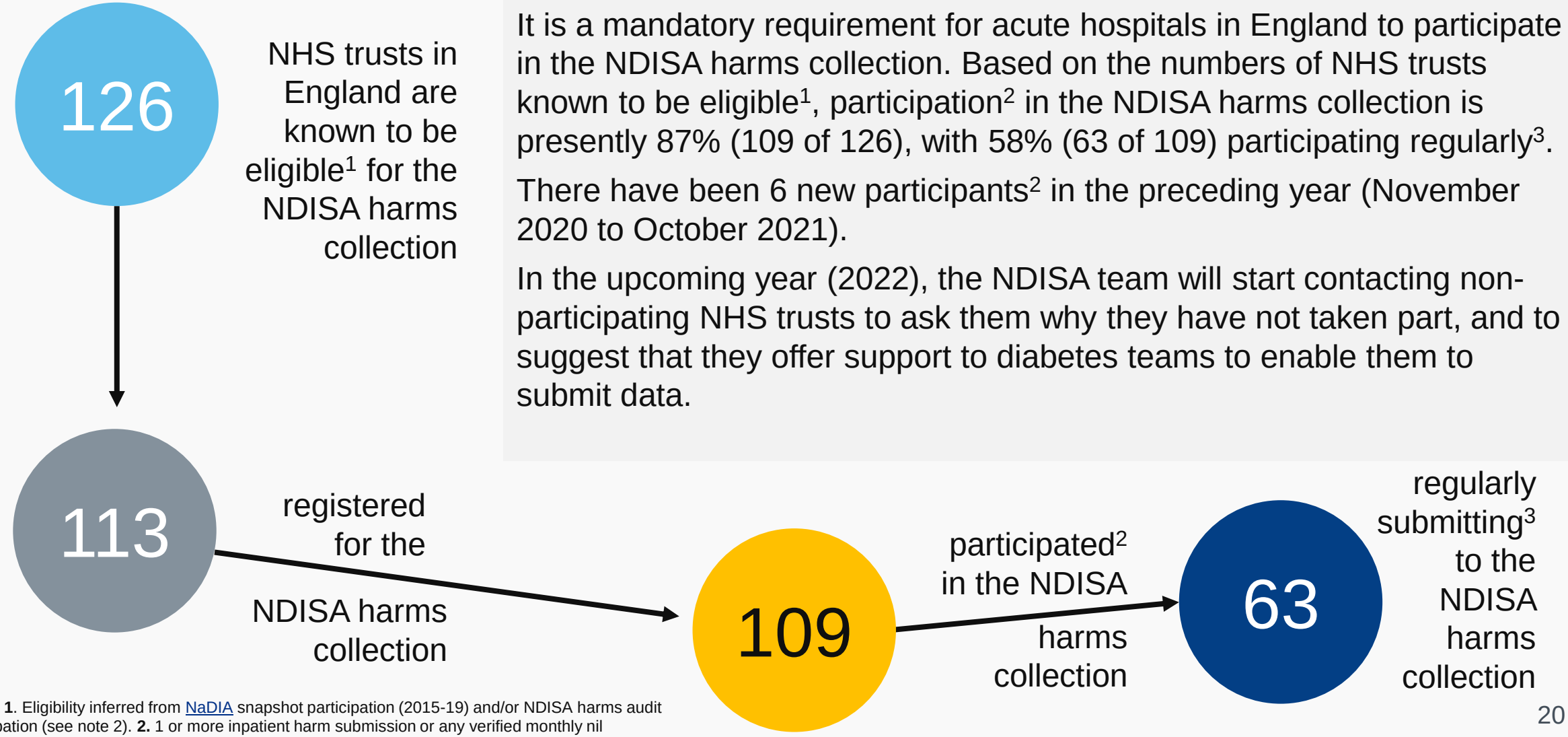
HHS is a potentially life-threatening emergency which should not develop in hospital.

Diabetic foot ulcer (DFU): Patients with diabetes are at a higher risk of developing foot lesions (ulcers) if they have diabetes associated blood flow (ischaemia) and nerve problems (neuropathy).

Preventive care should stop new foot lesions developing in hospital.

4. Inpatient harms: Trends

Participation



It is a mandatory requirement for acute hospitals in England to participate in the NDISA harms collection. Based on the numbers of NHS trusts known to be eligible[1], participation[2] in the NDISA harms collection is presently 87% (109 of 126), with 58% (63 of 109) participating regularly[3].

There have been 6 new participants[2] in the preceding year (November 2020 to October 2021).

In the upcoming year (2022), the NDISA team will start contacting non-participating NHS trusts to ask them why they have not taken part, and to suggest that they offer support to diabetes teams to enable them to submit data.

Notes: **1**. Eligibility inferred from NaDIA snapshot participation (2015-19) and/or NDISA harms audit participation (see note 2). **2.** 1 or more inpatient harm submission or any verified monthly nil submission. **3.** As for note 2, in all 8 quarters of latest 2 years: November 2019 to October 2021.

4. Inpatient harms: Trends

Frequency of inpatient harms by type

Chart 4.1: Number of inpatient harms, by harm type, England, May 2018 - October 2021 (rounded[1])

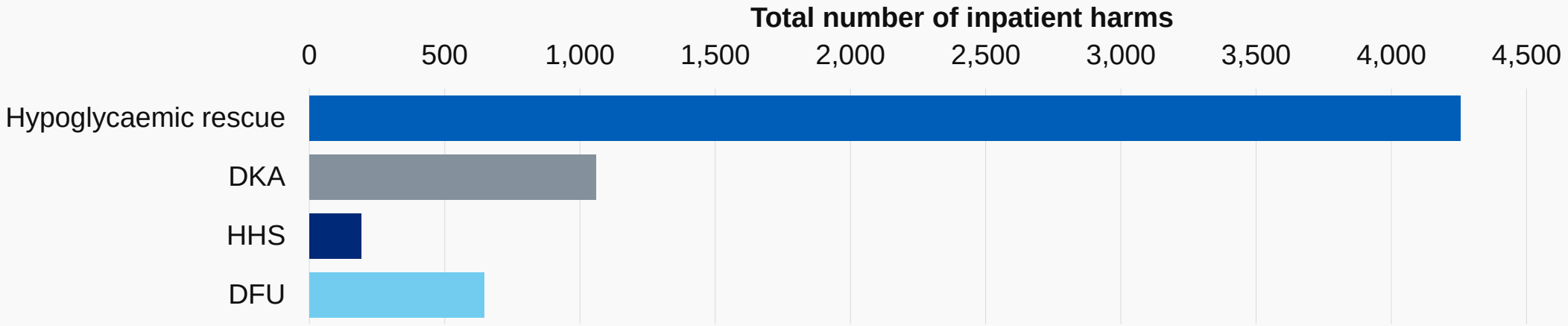


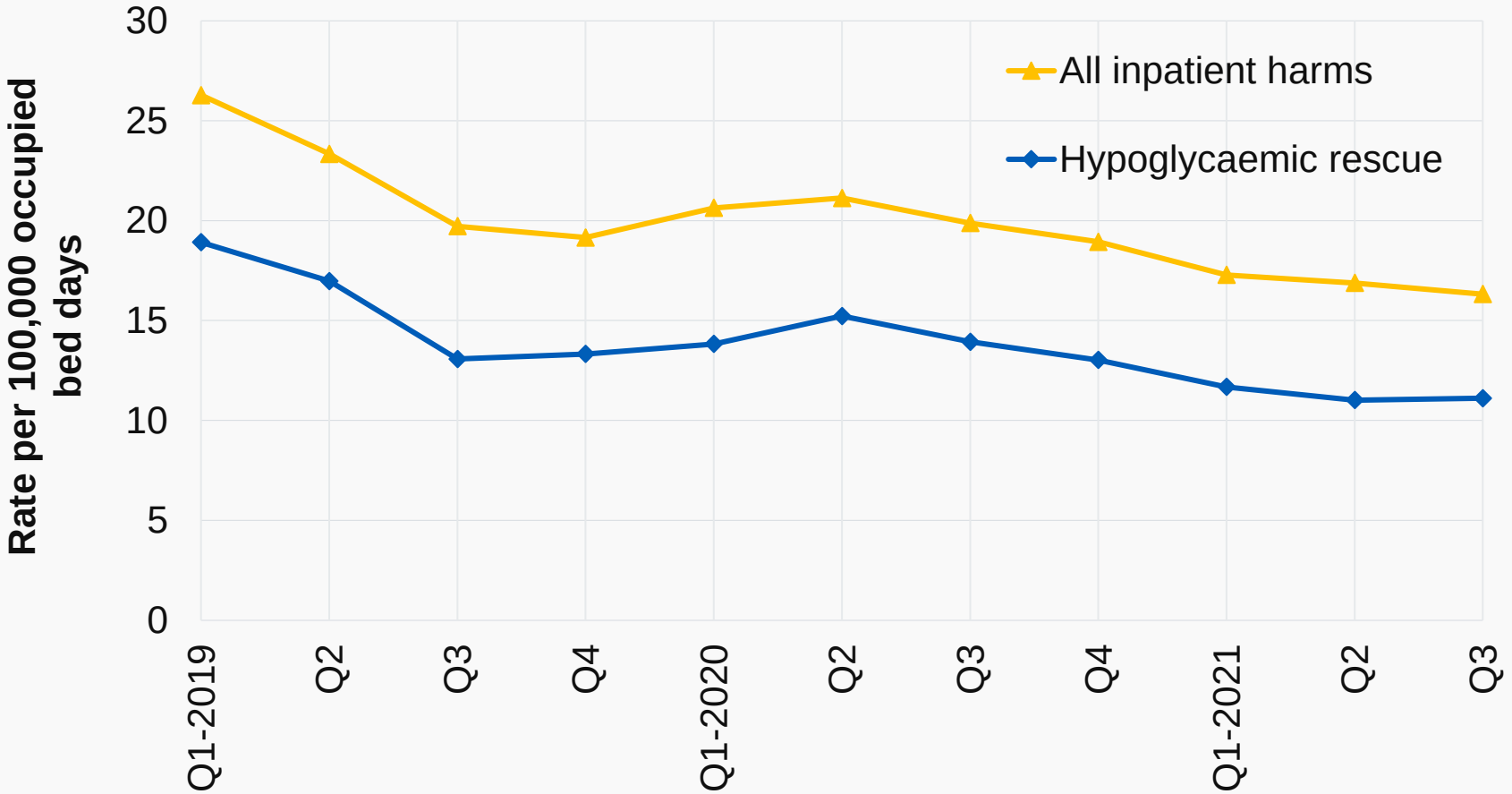
Table 4.1: Number of inpatient harms, by harm type and quarter when inpatient harm occurred,
England, May 2018 - October 2021 (rounded[1])

Inpatient harm	May – Jul 18	Aug – Oct 18	Nov 18 – Jan 19	Feb – Apr 19	May – Jul 19	Aug – Oct 19	Nov 19 – Jan 20	Feb – Apr 20	May – Jul 20	Aug – Oct 20	Nov 20 – Jan 21	Feb – Apr 21	May – Jul 21	Aug – Oct 21	Total
Hypoglycaemic rescue	210	335	455	440	360	310	325	305	245	270	260	230	275	230	4,255
DKA	50	85	80	80	70	80	90	75	65	65	90	55	80	85	1,060
HHS	5	15	25	15	15	10	10	15	10	15	20	15	10	10	190
DFU	60	50	65	75	55	65	45	40	40	35	30	25	40	20	645
Total	**325**	**485**	**625**	**615**	**500**	**465**	**475**	**435**	**360**	**385**	**400**	**325**	**405**	**345**	**6,150**

Notes: 1. Counts have been rounded. Counts between 1 and 7 are represented as a 5. All counts greater than 7 have been rounded to the nearest 5. Consequently the total will not usually match the sum of the 4 constituent inpatient harms.

4. Inpatient harms: Rate of inpatient harms by quarter: Hypoglycaemic rescue

Chart 4.2: Inpatients with diabetes, by quarter: rate of all inpatient harms and hypoglycaemic rescue[2,3],
England, January 2019 - September 2021 (rounded[1])



Findings:

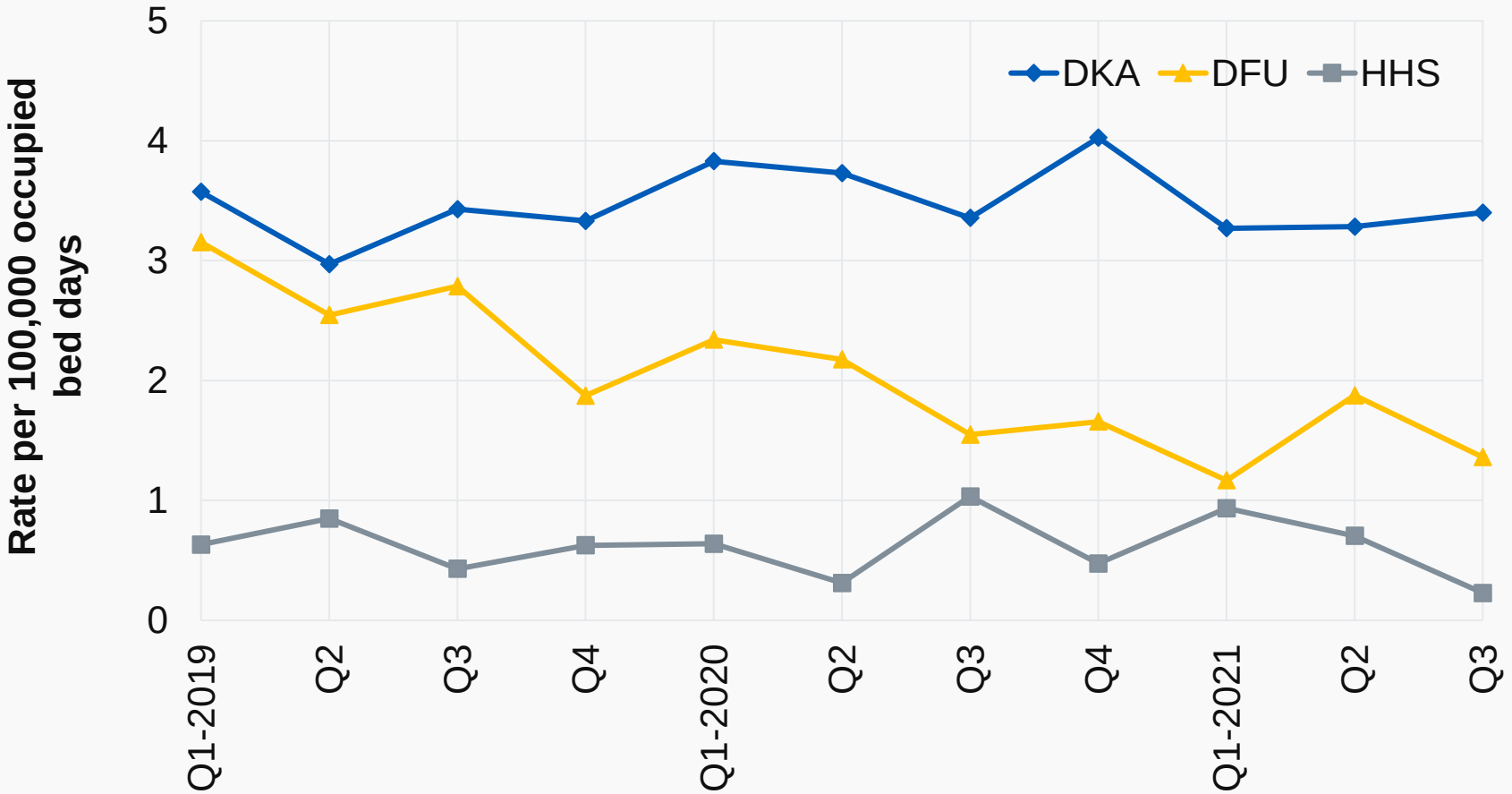
Chart 4.2 (left) shows that the rate of total inpatient harms decreased by almost 40% from Q1 2019 (Jan-Mar) to Q3 2021 (Jul-Sep).

The decrease is largely driven by reductions in hypoglycaemic rescue, which comprise 69% of total inpatient harms. This trend tallies with the findings from the final NaDIA report (NaDIA 2019, Chart 2.2).

Notes: 1. Proportions and rates are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5. **2**. Analysis covering April-Oct 2021 uses provisional data from Hospital Episode Statistics (HES) and core National Diabetes Audit (NDA). **3**. Proportions and rates are calculated from the sum of nights in hospital during the period stated for people in the core NDA, where diabetes was diagnosed on or before admission. Day cases and same-day discharges are counted as zero days and are therefore excluded. For further information, see: Further information: Inpatient population with diabetes.

4. Inpatient harms: Rate of inpatient harms by quarter: DKA, DFU and HHS

Chart 4.3: Inpatients with diabetes, by quarter: rate of DKA, DFU and HHS[2,3],
England, January 2019 - September 2021 (rounded[1])



Findings

Chart 4.3 (left) shows that, although the rate of DFUs appears to follow a downward trend, there was no reduction in the rate of DKA and HHS. This also tallies with the findings from the final NaDIA report (NaDIA 2019, Charts 2.3-2.5).

Notes: 1. Proportions and rates are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5. **2**. Analysis covering April-Oct 2021 uses provisional data from HES and core NDA. **3**. Proportions and rates are calculated from the sum of nights in hospital during the period stated for people in the core NDA, where diabetes was diagnosed on or before admission. Day cases and same-day discharges are counted as zero days and are therefore excluded. For further information, see: Further information: Inpatient population with diabetes.

5. Inpatient harms: Patient profiles

5. Inpatient harms: Patient profiles

Background

This section of the report looks at characteristics associated with a greater risk of the 4 inpatient harms collected by the National Diabetes Inpatient Safety Audit (NDISA), with the aim of better understanding high-risk features which might help target preventive care.

The hospital admission characteristics of people with diabetes are identified in the Hospital Episode Statistics (HES). Patient demographics, diabetes characteristics, treatment targets and care processes are linked from the core National Diabetes Audit (NDA).

Data from the NDISA harms collection is used to identify hospital bed days where 1 of the following inpatient harms occurred: hypoglycaemic rescue, diabetic ketoacidosis (DKA), hyperosmolar hyperglycaemic state (HHS) and diabetic foot ulcer (DFU). A baseline population of inpatients with diabetes is created for comparison, excluding bed days where an inpatient harm occurred.

To adjust for length of stay, figures are based on occupied bed days. For example, a hospital stay lasting 1 night counts as 1 occupied bed day, 5 nights counts as 5 occupied bed days etc. The statistical significance of differences between occupied bed days where a harm occurred versus the bulk of days where a harm did not occur was assessed at the 95% level.

Findings:

Overall, those experiencing inpatient harms are more likely to:

- Have been admitted as an emergency (see Table 5.4).
- Have type 1 diabetes (Table 5.2).
- Have not received 8 care processes in the last 12 months (Table 5.3).
- Have not met the HbA1c treatment target (Table 5.3).
- Experience cardiovascular or diabetes-specific complications on admission or during their hospital stay (Table 5.5). In particular, inpatients having strokes on or during admission are more likely to experience HHS during their hospital stay.

5. Inpatient harms: Patient profiles

Summary

Table 5.1: Summary of characteristics associated with each inpatient harm compared to the whole inpatient population with diabetes[1], England, May 2018 - October 2021

Characteristic		Inpatient harm			
		Hypoglycaemic rescue	DKA	HHS	DFU
Demo-graphics	Age	Younger	Younger	Older	None
	Sex	None	Female	Male	Male
	Ethnicity	White	White	None	White
	Smoking status[2]	Current	Current	None	None
	Deprivation quintile	Least	Least	None	None
	BMI	Lower	Lower	Lower	None
Diabetes charact-eristics	Diabetes type	Type 1	Type 1	Type 1	Type 1
	Diabetes duration	Longer	Longer	Longer	Longer
	Renal function	Worse	Better	None	Worse
Treatment targets and care processes[3]	Blood pressure (≤ 140/80)	None	None	None	None
	Cholesterol (< 5 mmol/L)	Not met	Not met	None	None
	HbA1c (≤ 58 mmol/mol)	Not met	Not met	Not met	Not met
	Met 3 treatment targets?	No	No	No	No
	Had all 8 care processes?	No	No	None	No
Hospital admissions	Admission method[4]	Emergency	Emergency	Emergency	Emergency
	Admission type	Medical	Surgical	Medical	Surgical
Complications during admission[5]		Heart failure, Admitted for DKA, Admitted with diabetic foot disease, Renal replacement therapy (RRT) required during admission	Angina, Heart failure, Admitted for DKA, RRT required during admission	Stroke, Admitted for DKA, Admitted with diabetic foot disease	Heart failure, Admitted for DKA, Admitted with diabetic foot disease, RRT required during admission

Table 5.1 (left) compares the group characteristics for each inpatient harm against those of the whole **inpatient population with diabetes**. For example, we can see that the group experiencing inpatient DKA tend to be younger than the wider inpatient population with diabetes.

Different results would be found if comparing inpatient harms against a different population. For example, DKA and hypoglycaemic rescue would almost certainly be associated with higher (not lower) deprivation if compared to the England and Wales population.

Notes: **1**. Statistical significance of harms population vs. inpatient population with diabetes at the 95% level. Proportions are tested using the Chi-squared test. Medians are tested using the Mann–Whitney U test. **2**. Group comprises of non-smokers whose history is unknown and patients who have never smoked. **3.** See note 4 on slide 28. **4.** See note 4 on slide 29. **5.** See note 4 on slide 30.

5. Inpatient harms: Patient profiles

Diabetes characteristics

Table 5.2: Diabetes characteristics, by inpatient harm[2],
England, May 2018 - October 2021 (rounded[1])

Group	Diabetes type			Diabetes duration		Renal function (Estimated glomerular filtration rate – eGFR) (ml/min/1.73m^2)	
	Type 1	Type 2		Median		Median	
	%	%					
Inpatient population with diabetes	**7.7**	**92.3**		**12.0**		**67.7**	
• Hypoglycaemic rescue	34.1	65.9	*	19.0	*	58.8	*
• DKA	63.5	36.5	*	21.0	*	77.2	*
• HHS	13.9	86.1	*	16.0	*	66.8	n
Inpatient population with diabetes[3] (Length of stay – LOS≥3)	**7.5**	**92.5**		**12.0**		**67.2**	
• DFU (LOS≥3)	14.3	86.6	*	16.0	*	58.2	*

Findings

Table 5.2 (left) shows that higher risk characteristics for inpatient harms include:

- Diabetes **type 1**
- Longer diabetes **duration**
- Impaired **renal function** (except DKA and HHS)

Notes: * = statistically significant at the 0.05 level vs. inpatient population. n = not statistically significant. Proportions are tested using the Chi-squared test. Medians are tested using the Mann–Whitney U test. Cases with missing or unknown values are excluded from the calculations. The proportions of the inpatient population (data row 1, all diabetes) with missing or unknown values are: Diabetes type 3.5%; Diabetes duration 1.9%; eGFR 13.2%. **1**. Percentages are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5. Consequently some percentages may not sum up to exactly 100%. **2**. Proportions are calculated from the sum of nights in hospital during the period stated for people in the core NDA, where diabetes was diagnosed on or before admission. Day cases and same-day discharges are counted as zero days and are therefore excluded. For further information, see: Further information: Inpatient population with diabetes. **3**. See note 2 above, with additional exclusion for admissions that are less than 3 nights due to the audit requirement that new onset foot ulcers must occur more than 72 hours after admission.

5. Inpatient harms: Patient profiles

Treatment targets and care processes

Table 5.3: Treatment targets and care processes in the audit year preceding hospital admission[4], by inpatient harm[2], England, May 2018 - October 2021 (rounded[1])

Group	Treatment targets[4] in year prior to admission								Received all 8 care processes[4] in year prior to admission	
	Blood pressure (≤ 140/80)		Cholesterol (< 5 mmol/L)		HbA1c (≤ 58 mmol/mol)		Met all 3 treatment targets			
	%		%		%		%		%	
Inpatient population with diabetes	**67.6**		**67.7**		**56.3**		**31.4**		**43.5**	
• Hypoglycaemic rescue	68.1	n	64.2	*	26.0	*	14.6	*	37.8	*
• DKA	67.0	n	56.3	*	14.2	*	7.1	*	37.6	*
• HHS	68.8	n	68.8	n	34.4	*	18.8	*	40.6	n
Inpatient population with diabetes[3] (LOS≥3)	**67.5**		**67.7**		**56.3**		**31.4**		**43.0**	
• DFU (LOS≥3)	65.5	n	67.3	n	44.2	*	22.1	*	36.3	*

Findings: Table 5.3 (left) shows that higher risk characteristics for inpatient harms include:

- Higher **HbA1c** in the audit year prior to admission
- Not having all 8 **care processes** in the audit year prior to admission (except HHS)

The low proportion for each harm not meeting all 3 treatment targets is primarily driven by those missing the HbA1c target.

Notes: * = statistically significant at the 0.05 level vs. inpatient population. n = not statistically significant. Proportions are tested using the Chi-squared test. Cases with missing or unknown values are excluded from the calculations. The proportions of the inpatient population (data row 1, all diabetes) with missing or unknown values are: 8.6-8.7% (all variables). **1**. Percentages are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5. Consequently some percentages may not sum up to exactly 100%. **2**. Proportions are calculated from the sum of nights in hospital during the period stated for people in the core NDA, where diabetes was diagnosed on or before admission. Day cases and same-day discharges are counted as zero days and are therefore excluded. For further information, see: Further information: Inpatient population with diabetes. **3**. See note 2 above, with additional exclusion for admissions that are less than 3 nights due to the audit requirement that new onset foot ulcers must occur more than 72 hours after admission. **4.** Treatment target and care process information was taken from the core NDA audit year prior to the hospital admission (e.g. from 2017-18 where the person's hospital admission was in 2018-19).

5. Inpatient harms: Patient profiles

Hospital admissions

Table 5.4: Hospital admission method and main specialty, by inpatient harm[2],
England, May 2018 - October 2021 (rounded[1])

Group	Admission method[4]				Admission type[4]			
	Emergency	Elective	Other		Medical	Surgical	Other	
	%	%	%		%	%	%	
Inpatient population with diabetes	**83.9**	**9.8**	**6.3**		**71.7**	**22.1**	**6.3**	
• Hypoglycaemic rescue	93.8	3.2	3.1	*	81.3	18.3	0.4	*
• DKA	91.4	6.1	2.5	*	69.2	30.3	0.5	*
• HHS	91.4	2.9	2.9	*	85.7	14.3	0.0	*
Inpatient population with diabetes[3] (LOS≥3)	**84.1**	**9.1**	**6.9**		**71.8**	**20.9**	**7.4**	
• DFU (LOS≥3)	89.2	5.8	5.0	*	70.0	29.2	0.8	*

Findings

Table 5.4 (left) shows that higher risk characteristics for inpatient harms include:

- **Emergency** admission

Hypoglycaemic rescue and HHS are associated with medical admission and DKA and DFU are associated with surgical admissions.

Notes: * = statistically significant at the 0.05 level vs. inpatient population. n = not statistically significant. Proportions are tested using the Chi-squared test. Cases with missing or unknown values are excluded from the calculations. The proportions of the inpatient population (data row 1, all diabetes) with missing or unknown values are: Admission method 0.0%; Admission type 0.2%. **1**. Percentages are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5. Consequently some percentages may not sum up to exactly 100%. **2**. Proportions and rates are calculated from the sum of nights in hospital during the period stated for people in the core NDA, where diabetes was diagnosed on or before admission. Day cases and same-day discharges are counted as zero days and are therefore excluded. For further information, see: Further information: Inpatient population with diabetes. **3**. See note 2 above, with additional exclusion for admissions that are less than 3 nights due to the audit requirement that new onset foot ulcers must occur more than 72 hours after admission. **4.** Admission method = The method of admission to hospital e.g. emergency or elective. An elective admission is one that has been arranged in advance. Admission type is defined by the specialty under which consultant is contracted e.g. surgical or medical. The category 'Other' covers: Admission methods 'Maternity' and 'Other'; Admission types 'Other', 'Pathology', 'Psychiatry' and 'Radiology'.

5. Inpatient harms: Patient profiles

Complications

Table 5.5: Complications during hospital admission, by inpatient harm[2],
England, May 2018 - October 2021 (rounded[1])

Group	Cardiovascular complications[4] (on or during admission)								Diabetes-specific complications[4] (at specified point during admission)							
	Angina		Myocardial infarction		Heart failure		Stroke		Admitted for DKA[5, 6]		Admitted with diabetic foot disease		RRT required during admission	
	%		%		%		%		%		%		%	
Inpatient population with diabetes	**7.9**		**3.6**		**21.8**		**7.5**		**1.0**		**5.1**		**4.9**	
• Hypoglycaemic rescue	7.3	n	4.1	n	26.6	*	7.5	n	5.6	*	7.5	*	8.5	*
• DKA	5.1	*	4.5	n	12.6	*	7.6	n	22.7	*	5.1	n	8.1	*
• HHS	5.7	n	5.7	n	22.9	n	28.6	*	2.9	*	2.9	*	5.7	n
Inpatient population with diabetes[3] (LOS≥3)	**7.6**		**3.6**		**22.6**		**8.2**		**0.9**		**5.4**		**5.2**	
• DFU (LOS≥3)	6.7	n	4.2	n	33.3	*	9.2	n	1.7	*	15.8	*	10.0	*

Findings:

Table 5.5 (left) shows that most cardiovascular or diabetes-specific complications are associated with inpatient harms.

In particular, inpatients having strokes on or during admission are more likely to experience HHS during their hospital stay.

Notes: * = statistically significant at the 0.05 level (vs. inpatient population with diabetes). n = not statistically significant (vs. Inpatient population with diabetes). Proportions are tested using the Chi-squared test. **1**. Percentages are derived from rounded values. Underlying counts between 1 and 7 are set to 5. All counts greater than 7 are rounded to the nearest 5. Consequently some percentages may not sum up to exactly 100%. **2**. Proportions and rates are calculated from the sum of nights in hospital during the period stated for people in the core NDA, where diabetes was diagnosed on or before admission. Day cases and same-day discharges are counted as zero days and are therefore excluded. For further information, see: Further information: Inpatient population with diabetes. **3**. See note 2 above, with additional exclusion for admissions that are less than 3 nights due to the audit requirement that new onset foot ulcers must occur more than 72 hours after admission. **4.** Complication recorded at any point during the admission, except: 'Admitted for DKA' and 'Admitted with diabetic foot disease'. **5**. The definition of Admitted for DKA only includes admissions where DKA was the 1st diagnosis code on the 1st episode of the admission. The 2019 National Diabetes Inpatient Audit (NaDIA) harms audit report included cases where DKA was in any diagnosis position on the 1st episode of the hospital admission.

6. Further information

6. Further information: NDISA harms audit linkage

To produce the patient profiles, National Diabetes Inpatient Safety Audit (NDISA) harms audit data was enriched by linkage:

NDISA harms audit

● Hypoglycaemic rescue ● Diabetic ketoacidosis (DKA) ● Hyperosmolar hyperglycaemic state (HHS) ● Diabetic foot ulcer (DFU)

Filters: Date of inpatient harm during period: May 2018 to Oct 2021

Joined on NHS number

where HES admission start/end dates overlap with date of inpatient harm

Hospital Episode Statistics (HES) Admitted Patient Care (APC)

● Admission method/type

Cardiovascular complications:
● Angina ● Myocardial infarction ● Heart failure ● Stroke

Diabetes-specific complications:
● Required renal replacement therapy (RRT) ● Admitted for DKA ● Admitted with diabetic foot disease

Filters:
● HES episode classed as finished
● Inpatient admissions only – day cases, same-day discharges and regular day/night attendances are excluded

Joined on NHS number

Core National Diabetes Audit (NDA)

● Age at start of NDA year[1] ● Sex[1] ● Ethnicity[1] ● Diabetes type[1] ● Diabetes duration at start of NDA year[1] ● Smoking status[2] ● Body mass index[2] ● Renal function[2] ● Deprivation quintile[2] ● Treatment targets[3] ● Care processes[3]

Notes: **1**. From the core NDA demographics table. **2**. Taking the value closest to the inpatient harm date (in corresponding NDA year or one of the preceding three years). **3**. Taking the value from the NDA year preceding the inpatient harm year (defined as Apr-Mar).

6. Further information:

Inpatient population with diabetes

Linkage was also used to produce a comparison population of inpatients with diabetes to compare with the profile of inpatients with inpatient harms recorded:

Core NDA All years

● Sex[1] ● Ethnicity[1] ● Diabetes type[1] ● Diabetes duration at start of NDA year[1] ● Smoking status[2] ● Body mass index[2] ● Renal function[2] ● Deprivation quintile[2] ● Treatment targets[3] ● Care processes[3]

Notes: **1**. From the cumulative core NDA demographics table, supplemented by the ongoing NDA 2021-22 collection. **2**. Taking the value from the NDA year corresponding to the admission year. **3**. Taking the value from the NDA year preceding the admission year.

Joined on NHS number

Filters: Patient in both NDA and HES cohorts

HES APC 2015-16 to 2020-21 & 2021-22 (provisional)

● Occupied bed days ● Admission method/type

Cardiovascular complications:
● Angina ● Myocardial infarction ● Heart failure ● Stroke

Diabetes-specific complications: ● Required RRT ● Admitted for DKA ● Admitted with diabetic foot disease

Filters: ● HES episode classed as finished
● Inpatient admissions only – day cases, same-day discharges and regular day/night attendances are excluded.
● Aged 17+ on admission.
● Diagnosed with diabetes on or before admission.
● Where compared with inpatient harm characteristics, hospital days where any inpatient harms occurred are excluded.
● Cross-HES year admissions are merged where NHS number, admission date, admission method and admission source all match.
● Admissions are deleted if fully enveloped by another admission.

Comparison:

Inpatient population with diabetes

Characteristics of the inpatient population, adjusted for nights in hospital
e.g. 1 night is counted once, 7 nights are counted 7 times etc.

6. Further information: References

Diabetes UK Making Hospitals Safe for People with Diabetes: https://www.diabetes.org.uk/professionals/resources/improving-inpatient-care-programme

GIRFT Programme Getting It Right First Time: National Specialty Report: Diabetes (2020) https://www.gettingitrightfirsttime.co.uk/wp-content/uploads/2020/11/GIRFT-diabetes-report.pdf

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NHS England Urgent and Emergency Care Daily Situation Reports 2021-22: https://www.england.nhs.uk/statistics/statistical-work-areas/uec-sitrep/urgent-and-emergency-care-daily-situation-reports-2021-22/

NICE NG19 Diabetic foot problems: Prevention and management https://www.nice.org.uk/Guidance/NG19

NICE QS6 Diabetes in adults https://www.nice.org.uk/Guidance/QS6

6. Further information: Acknowledgements

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Development and delivery of NDISA is guided by a multi-professional advisory group of clinicians and experts by experience, chaired by Alistair Lumb. The NDISA Advisory Group members include:

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NHS Digital is the new name for the Health and Social Care Information Centre. NHS Digital managed the publication of the 2022 NDISA report.

Diabetes UK is the largest organisation in the UK working for people with diabetes, funding research, campaigning and helping people live with the condition.

The **National Cardiovascular Intelligence Network** (NCVIN) is a partnership of leading national cardiovascular organisations which analyses information and data and turns it into meaningful timely health intelligence for commissioners, policy makers, clinicians and health professionals to improve services and outcomes.

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