

Addressing barriers to accurate discharge data quality through a co-designed educational intervention

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Abstract

Background The Hospital In-Patient Enquiry (HIPE) system is Ireland's national administrative database for activity in publicly funded acute hospitals. It informs healthcare planning, funding allocation, and patient safety monitoring. However, Hospital-Acquired Adverse Events (HAAEs) may be underrepresented within administrative datasets due to challenges in clinical documentation, uncertainty regarding HAAE identification, and limited communication between clinicians and Administrative Health Data (AHD) coders. This study aimed to develop and pilot a co-designed educational intervention to improve documentation and coding of selected HAAEs.

Methods A four-stage co-creation framework was employed, consisting of (1) evidence review, (2) data collection and stakeholder consultation, (3) co-production, and (4) prototyping. Literature and policy reviews were conducted to identify existing challenges and education associated with administrative data recording, focused on improving documentation related to three underreported HAAEs: delirium, pneumonia, and urinary tract infections. Data were collected from non-consultant hospital doctors (NCHDs) through three focus groups and discussions with consultants, and from AHD coders and managers through a national survey and policymaker consultation. Findings informed collaborative development of an educational intervention. Prototype resources were piloted with new NCHDs, and perceived acceptability and value were assessed.

Results In co-creating resources, twelve NCHDs took part in focus groups and seventy-five AHD coders and managers completed a mixed-methods survey. Both groups reported barriers to data production including limited understanding of each other's roles in data production processes. Insights informed the development of targeted educational resources designed to tie-in with existing clinical processes. In a pilot evaluation, with a further ten newly qualified NCHDs, all participants reported low confidence in completing documentation to support HAAE coding prior to the intervention. Following the intervention, all reported increased confidence and high acceptability of resources.

Conclusions This study demonstrates the feasibility and acceptability of a co-designed educational intervention aimed at improving patient documentation and accurate recording of hospital-acquired adverse events. The participation of NCHDs and AHD coders supported the co-creation of resources addressing real-world documentation and coding challenges. While further evaluation across multiple sites is required, findings suggest that targeted, co-produced educational tools may contribute to improvements in administrative data quality, enhanced patient safety monitoring and healthcare planning.

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Keywords Hospital administrative data · Co-design · Health information systems · Data quality · Quality improvement · Clinical coding · Documentation quality · Patient safety · Hospital-acquired infection · Educational intervention

Background

In Ireland, the Hospital In-Patient Enquiry (HIPE) system serves as the national administrative database for activity in publicly funded acute hospitals [1]. HIPE captures demographic, clinical, and administrative patient information and informs national health service planning, resource allocation and funding [2]. In addition to supporting administrative and financial functions, national administrative data have also been increasingly used in research examining patient safety and the prevalence of hospital-acquired adverse events within acute hospital settings [3–5]. Despite its importance, it is known that Irish administrative health data does not currently reflect the full extent and true prevalence of adverse events as experienced by older patients [5].

Hospital-acquired adverse events (HAAEs) refer to conditions that develop, or in some cases worsen, during a hospital stay and were not present at the time of patient admission [6]. HAAEs are associated with poorer patient outcomes, including prolonged hospital stays, higher healthcare costs and are significant predictors of inpatient mortality [7]. Common HAAEs such as delirium, pneumonia, and urinary tract infections are particularly prevalent among older and medically complex patients [8, 9]. Monitoring the occurrence of these events is an important step in improving both patient safety and transparency of hospital processes, as it allows healthcare systems to identify areas where increased resource allocation and quality improvement interventions may be required [10].

Discharge summaries are a key source of information for administrative coding and are commonly completed by NCHDs [11]. Therefore, the quality and completeness of discharge documentation directly influence the accuracy of national administrative datasets and subsequent healthcare planning and resource allocation [12, 13]. In addition to supporting continuity of care between hospital and community services, discharge summaries also contribute to the national patient dataset [14, 15] and therefore have a direct impact on the accuracy of national hospital data and the resultant resource allocation of health funding.

Despite their value, administrative datasets may underrepresent HAAEs due to a complex interaction between clinical documentation and recording practices, uncertainty regarding HAAE identification, and limitations within the coding process [16]. Although coders apply standardised coding rules, they rely on clear clinical documentation and may be unable to infer diagnoses or clarify ambiguous records within the constraints of their code definitions [17, 18]. Issues particularly arise in instances where diseases progress while in hospital, or when the timing of clinical events is ambiguous [12, 19].

It is acknowledged that discharge documentation is often produced at speed within clinical environments and may vary considerably in terms of prioritisation of diagnoses and degree of detail [20]. Despite this, NCHDs may have limited training in documentation practices beyond those required for clinical communication and therefore may be unfamiliar with how their documentation contributes to administrative coding processes and national data [21, 22]. Similarly, clinical coders must interpret narrative clinical information in accordance with established coding standards within tight timeframes, without the opportunity or means to clarify ambiguous or incomplete records with doctors [23, 24]. Notably, while the interaction between NCHD documentation and coder categorisation represents the production component of the data creation process, the accuracy of administrative data is also reliant on wider factors, including multidisciplinary documentation practices, organisational workflows, coding resources, and health information systems.

Differences in the priorities, responsibilities, and workflows of NCHDs and AHD coders may contribute to gaps in understanding between these professional groups and may ultimately affect the completeness of administrative health data, as observed both in Ireland and internationally [14, 15, 19, 20, 24]. Despite this, no formal means of communication between doctors and hospital coders has been established in Ireland. An effective approach to the

creation of meaningful, fit-for-purpose intervention development is co-production, whereby the perspectives of those directly involved in the process being targeted are incorporated into the development of interventions [25]. These tools can therefore be more closely aligned with existing clinical practices and administrative requirements than those informed by literature alone. In the context of the present study, co-production approaches offer the potential to improve shared understanding between clinicians and coders, support more accurate recording of hospital-acquired adverse events and enhance the overall quality of national administrative health data.

Methods

The present study was conducted with the employment of a four-stage co-creation intervention framework, carried out in a large, urban, model 4 hospital in Dublin, Ireland. The four stages comprised of: (1) Evidence Review (2) Data Collection and Stakeholder Consultation; (3) Co-production; and (4) Prototyping, as adapted from the iterative co-production framework as described by Hawkins et al. [26]. An overview of participants and processes in each section can be found in Table 1.

Stage one: evidence review

Scientific and policy literature was collected at stage one, which involved identifying and approaching educators of both non-consultant hospital doctors and AHD coders in order to examine the existing educational resources targeted at each group. This project was developed from of a larger body of research investigating the identification of HAAEs within Irish administrative health datasets. Previous analyses identified delirium, hospital-acquired pneumonia and urinary tract infections as conditions with particular challenges in accurate identification and recording due to difficulties distinguishing hospital-acquired from pre-existing conditions and dependence on explicit clinical documentation to code accurately [5, 16].

These three HAAEs were therefore determined to be the central focus of the intervention, due to the challenges both doctors and AHD coders face in the accurate capturing of these conditions. A structured literature search was conducted to identify studies and reports relating to HIPE coding and education for junior doctors in Ireland. The Hospital In-Patient Enquiry (HIPE) system is the primary source of hospital discharge data in Ireland and involves clinical coding using ICD-10-AM standards, making it a relevant focus for medical education and training. Researchers undertook a search of electronic databases, namely PubMed, Scopus and Google Scholar. In addition, grey literature sources were reviewed, including the websites of the Health Service Executive (HSE), Health Information and Quality Authority and the Healthcare Pricing Office, responsible for the implementation of the Activity Based Funding (ABF) model in acute public hospitals [27, 28]. These sources were included as HIPE training schemes are largely reported in policy documents and organisational reports rather than academic literature. Search terms were developed using three key concepts: HIPE and/or clinical coding, education and

Table 1 Processes at each stage of TFA framework

Stage	Participants	Method	Purpose
Stage 1	Experts	Evidence Review	Initial exploration of process, identify gaps
Stage 2	12 NCHDs	Focus Groups	Explore documentation practices in real-world setting
Stage 2	75 AHD coders/managers	Survey	Identify coding barriers and facilitators across several hospitals to inform intervention
Stage 2	Policymakers	Consultation/ Triangulation	Assess national policy on processes and understanding of real-world application
Stage 3	Subset of NCHDs/AHDs	Co-Production	Design intervention with its users
Stage 4	10 new NCHDs	Pilot Survey	Evaluate acceptability

training, and doctors, including terms such as junior doctors, non-consultant hospital doctors, resident doctors and postgraduate doctors. As Irish data was limited, studies were limited to Irish or comparable publicly funded healthcare systems, including the United Kingdom, Australia and Canada. These systems were deemed comparable due to similarities in administrative data collection, coding standards and hospital funding structures. Reference lists of relevant articles and reports were hand-searched to identify further studies. Findings from the literature and policy review were reviewed by three experts with experience in clinical coding and HIPE management and four experts in medical education to ensure relevance and completeness. Feedback was incorporated through iterative revisions to the educational content and study approach. With this knowledge acquired, and an understanding of each group's knowledge on their counterparts, stakeholders were then approached.

Stage two: data collection and stakeholder consultation

Stage two consisted of data collection and stakeholder consultation, which took place with two cohorts, an AHD coder cohort and a NCHD cohort. These groups were approached separately in order to assess each group's understanding of the patient data charting and coding process from their two distinct perspectives - producer and interpreter.

Consultants supervising a relevant unit in a partnering hospital were approached about the project by researchers, who invited them to partake in the process as experts and to involve NCHDs who were deemed to have experience in the process being examined. As NCHDs progress after a year in the role, it was deemed most appropriate to recruit NCHDs at the end of their year in the role to capture those with the most experience. A group of eligible NCHDs were then approached to take part in three focus groups over a course of three weeks. The majority ($N=12$) of the eligible NCHDs ($N=14$) agreed to participate in the study. One-hour long focus groups, with four participants in each, took place in the hospital site after an initial introduction and consent process, where the researcher re-introduced herself and the project aims with the NCHDs. Thematic analysis was performed on the resultant data. Consultations with their supervising consultants regarding current processes of charting were then held to triangulate collected data for full understanding of the charting process, who broadly agreed with the NCHD assessment of the situation.

Data collected with AHD coders was assisted by the coders' overseeing body, who agreed to both review and disseminate a survey to a large body of national AHD coders and managers on behalf of the research team. The survey and accompanying participant information leaflets and consent forms were disseminated via email accompanied by the researchers' details and survey deadline. On volunteering to participate and consenting to the survey, the survey was accessible to AHD coders. This survey comprised of open-ended text boxes open to both AHD coders and managers and responses were collected up to a cut-off date. Seventy-five AHD coders and managers participated in the study, and content analysis was undertaken on their responses. Triangulation of this data was performed through consultations with three HIPE policymakers and controllers to understand the policies and processes underpinning the production of national patient data, who both supported and echoed the concerns of their colleagues.

The selection of AHD coders and non-consultant hospital doctors participating in the data production journey as well as their supervisors was undertaken to ensure understanding of the processes of both HIPE and hospital doctors as they occurred in theory and in practice. Finally, a subset from the AHD coder ($n=4$) and NCHD groups ($n=2$) was established to inform the initial structure and medium of the intervention, participating in stage three, co-production.

Stage three: co-production

Stage three, co-production, involved consolidating the most pertinent pieces of data from the literature, policy, AHD coder data and NCHD focus groups. This built upon the knowledge acquired in stage two, which allowed for the clarification of the aims, and day-to-day functioning of the processes of patient data generation. In stage

three, once these data points were established, the researchers could determine the gaps in the knowledge, formulate content to fill these gaps, and establish the most appropriate format in which to deliver this knowledge. The content was then shared with alternative NCHDs ($N=2$) and representatives from the AHD coding community ($N=4$) to triangulate the data and to enhance the credibility and validity of the original findings. Representatives broadly agreed and added to their colleagues' experiences, with no major discrepancies recorded. As per NCHD preference, data were synthesised into an educational video resource and an accompanying hard-copy visual aid to be worn on a lanyard.

Stage four: pilot intervention

Lastly, stage four comprised of developing and piloting a prototype of the hard and soft educational resources. The educational intervention was piloted with incoming NCHDs, who were asked to complete a survey, developed using the seven constructs of the Theoretical Framework of Acceptability (TFA) of healthcare interventions [29], due to its flexibility given the development and piloting of the intervention and its focus on burden within already constrained health systems. As the survey was developed as a pragmatic pilot evaluation tool, formal psychometric testing was not undertaken. However, survey items were informed by the TFA framework and reviewed by members of the research team and relevant stakeholders to establish face validity. This survey aimed to measure the acceptability, coherence, costs, perceived efficacy and fidelity of the intervention to key stakeholders. Newly-qualified NCHDs were asked to engage with the resources after completing a post-intervention survey, measuring perceived confidence and self-efficacy in the completion of discharge summaries to allow accurate coding of HAAEs. For the purposes of this intervention, the Irish administrative health data system, HIPE, was referred to by name for contextual clarity. On receipt of the educational resources, NCHDs were asked to anonymously indicate (from 1 = strongly disagree, to 5 = strongly agree) how much they agreed with the following statements: "The learning objectives of the session were clear", "The session improved my understanding of HIPE coding", "I understand what constitutes a Hospital-Acquired Adverse Event (HAAE)", "The importance of accurate discharge summaries for HAAE recording was clear", and "The examples provided were relevant to my clinical practice". NCHDs were then asked to complete a post-intervention survey, measuring perceived confidence and self-efficacy in the completion of discharge summaries to allow accurate coding of HAAEs. Open text boxes allowed for NCHDs to give further feedback and recommendations for improvements of the intervention. Where feasible, suggestions were synthesised with original content to produce the final resources.

Results

The four-stage co-creation framework facilitated the sequential development of the educational intervention, with findings from each stage informing subsequent stages of intervention design (Fig. 1). Each stage provided a knowledge foundation for the next, allowing researchers to build upon acquired knowledge and verify this foundation through an iterative process.

Stage one: evidence review

Literature and policy reviews found a dearth of literature on Irish collaborative doctor-coder processes, and limited education on administrative data systems for Irish junior doctors. A systematic search of the literature revealed very limited research on the NCHD and AHD coder collaborative relationship in an Irish context, with no studies directly addressing strategies to improve shared data production. Barriers to data generation included NCHD unfamiliarity with the processes and aims of administrative coding processes and national data [21, 22], the tight time allocations to both the completion by doctors and interpretation by coders of clinical information on charts and discharge summaries, and a lack of opportunity or methods of communication for coders and NCHDs

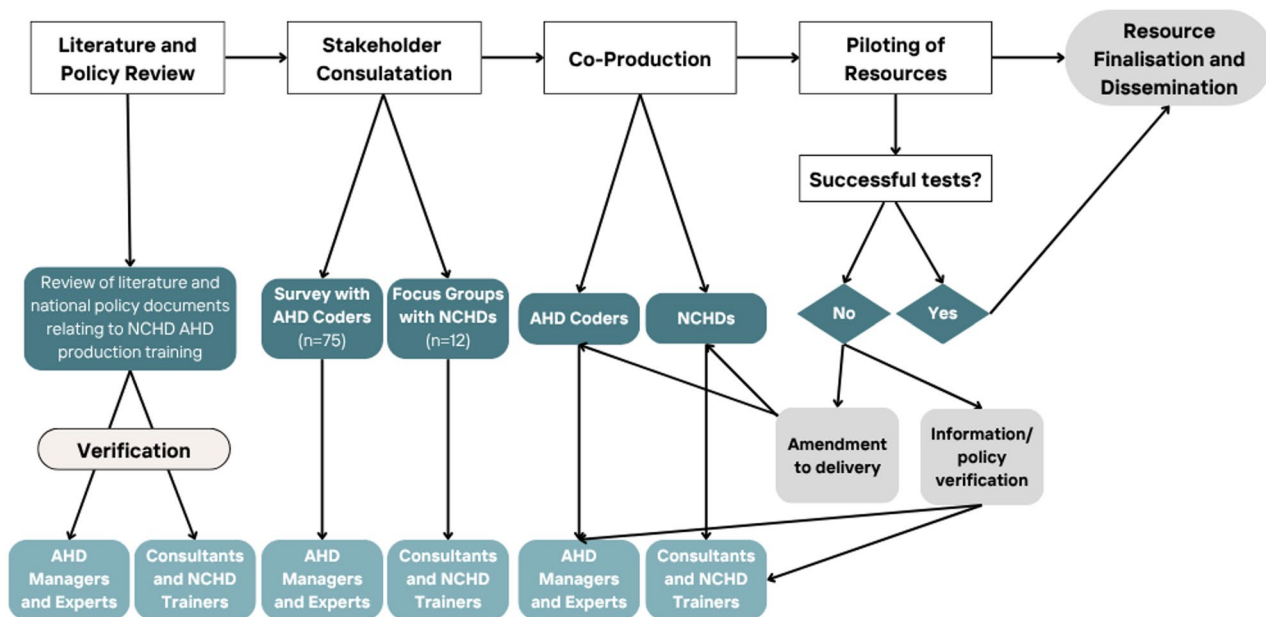


Fig. 1 Four-step intervention development framework

to directly contact one another to complete ambiguous or incomplete records [12, 24]. The limited evidence available highlighted a gap in knowledge regarding shared data production processes, justifying the need for co-produced intervention.

Stage two: data collection and stakeholder consultation

In stage two, twelve NCHDs participated in one of three focus groups, and a discussion took place that was underpinned by a semi-structured interview guide. These focus groups established current understanding of the administrative health data system and NCHD contribution to administrative data, how this data was used, the discharge summary “audience”, and the barriers to discharge summary and chart completion. Several themes were identified. Theme one pertained to time constraints and documentation practices, whereby NCHDs described discharge summary completion as a time-sensitive task often undertaken at the end of a shift, limiting the opportunity to provide comprehensive documentation. Theme two related to limited understanding of administrative data systems, where participants reported limited awareness of HIPE processes, the role and importance of AHD coders, and the use of administrative data beyond a means of communication to general practitioners. Lastly, theme three related to NCHD uncertainty regarding HAAE identification and documentation, where NCHDs reported concern and hesitation around when to record events as hospital-acquired and what terminology was required to facilitate accurate coding. This data assisted researchers in understanding what was being charted, where uncertainty lay, and practically, where and when charting took place, therefore providing foundations for an educational intervention that was both unobstructive to current processes and fit for purpose.

AHD coders and managers were also approached for participation in stage two. Seventy-five administrative data coders and their managers from multiple Irish hospitals participated in the survey. There was a variation in responses in the availability and usability of discharge summaries dependent on hospital. Respondents most often stated that a good discharge summary is typed, legible, concurrent with a patient’s chart, and can be used as an indicator of where to find important information in a chart. The consensus of respondents suggested that discharge summaries were helpful as they list *some* key diagnosis or events in the episode of care, however, they are not sufficiently comprehensive.

Table 2 Responsive intervention development

Challenge Identified	Intervention Response
NCHD lack of understanding of AHD processes and coder roles	Educational video explaining HIPE processes and coder responsibilities
Uncertainty regarding HAAE definitions	Inclusion of examples and clear diagnostic terminology with ‘coder-friendly’ labels
Limited time available for training	Short (< 15-minute) video format with quick-reference visual aids as real-time prompts
Need for accessible reminders	Development of lanyard reference aid
Lack of awareness of national impact	Inclusion of information on patient safety, planning and funding

Barriers to coding included charts being inaccurate and lacking in detail such as co-occurring HAAEs, discharge summaries containing conflicting information with chart, discharge summaries being incomplete or illegible, and technical issues such as time constraints and the use of carbon copies, which were stated to be “90%+ unreadable” at times. In terms of coding HAAEs, coders stated that their inability to infer or communicate directly with NCHDs in tight timeframes inhibited HAAE coding, making accurate HAAE coding challenging unless conditions were explicitly stated or evident within the clinical record i.e. treatment for catheter associated urinary tract infections. While there was often evidence of treatment of hospital-acquired pneumonia and urinary tract infection, allowing AHD coders to assign HAAE labels, coders stated that there were no “clues” for an unreported delirium and therefore delirium may be underreported in national data.

Triangulation of NCHD and AHD coder findings identified several shared barriers, including limited understanding of each group’s role in the data production process, uncertainty regarding HAAE definitions and documentation requirements, and a lack of formal communication mechanisms. These findings directly informed the content of the educational intervention, which focused on clarifying HIPE processes, improving recognition and documentation of HAAEs, and increasing awareness of the intertwined roles of clinicians and coders.

Stage two: co-production

In stage three, content was produced and refined through an iterative process of attending to gaps in administrative data coder and NCHD knowledge, verifying the information gathered to attend to these gaps in knowledge with administrative data coding experts and consultants. Table 2 illustrated the issues identified in stage two that were responded to in stage three.

In addition to educational content, stakeholders were asked to offer suggestions pertaining to the delivery of the intervention to best place it for sustainable, practical absorption into existing workflow. NCHDs selected a brief, sub-15-minute video, which they intended to watch once, and a supplementary lanyard tag which summarised the key points of the video for quick-reference while producing documentation. A brief, informative video presentation was created to attend to key gaps in knowledge, clarify eligibility criteria for HAAEs, and highlight key labels that could be used to communicate HAAEs identified by NCHDs to coders without the need for coder investigation. In addition, the value of both the NCHD and coder roles were discussed, as were the local, national and international benefits of accurate healthcare data.

Stage four: pilot intervention

Finally, stage four consisted of the piloting and evaluation of the educational resources. Piloting took place with the participation of a different cohort of NCHDs than those who participated in the co-design, as researchers wished to test perceived usefulness with a group that did not have the same degree of buy-in as co-producers. A survey, based on the seven constructs of the Theoretical Framework of Acceptability (TFA) of healthcare interventions, produced positive results from a cohort of ten newly-qualified NCHDs. Results of a survey indicated that all ten NCHDs were “Not confident” or “Slightly confident” in completing discharge summaries to allow accurate

HIPE coding of HAAEs pre-intervention. Post intervention, one NCHD had progressed to feeling “Moderately confident”, while nine NCHDs felt “Very confident” or “Extremely confident” post-intervention. All ten NCHDs agreed, or strongly agreed with the following five statements: “The learning objectives of the session were clear”, “The session improved my understanding of HIPE coding”, “I understand what constitutes a Hospital-Acquired Adverse Event (HAAE)”, “The importance of accurate discharge summaries for HAAE recording was clear”, and “The examples provided were relevant to my clinical practice”. Open text boxes to suggest amendments to improve clarity or areas that required further expansion. Limited amendments were suggested, which included a suggestion to include tangible costed benefits to improved data quality, and the individual benefit of improved quality to each patient. Where feasible, suggestions were integrated into the final products.

Discussion

This study explored the development and pilot evaluation of a co-designed educational intervention aimed at improving the quality of discharge documentation and the accurate recording of three HAAEs within the HIPE system, namely pneumonia, delirium and urinary tract infections. This study describes the development and pilot evaluation of a co-designed educational intervention aimed at improving documentation practices supporting HAAE recording within the HIPE system. Findings suggest that engaging NCHDs and AHD coders throughout the co-design process resulted in educational resources that were perceived as acceptable, relevant, and compatible with pre-existing and time-constrained clinical workflows.

The present study addresses an identified gap in the literature by examining the relationship between the processes of clinical documentation to administrative coding through direct engagement with both NCHDs and AHD coders. The intervention was designed to reflect the realities and adapt to the challenges of the Irish acute hospital environment in a responsive way. For example, the use of a short video resource and portable lanyard aid responded directly to the time constraints experienced by NCHDs. The absence of pre-existing means of communication between doctors and HIPE coders was also addressed by improving clinicians’ understanding of the coding process and the information required to support accurate data capture, rather than attempting to create a means of communication disruptive to existing work systems. The pilot evaluation indicated that participation in the intervention increased awareness among doctors of the coding process and improved their confidence in producing discharge summaries that are clearer for coding purposes. These findings suggest that relatively small, targeted interventions may contribute to improvements in the quality of administrative hospital data. In addition, while developed within the Irish healthcare context, many of the challenges identified, including time pressures, variability in clinical documentation, and limited understanding of administrative coding processes, have been described internationally [15, 16, 19, 20]. Therefore, the processes of collaborative, targeted educational intervention development employed in the present study may be transferable to other comparable healthcare systems where administrative data are used for quality monitoring, research, and funding decisions.

As literature has indicated, engaging those directly involved in the targeted change increases buy-in and more flexible, fit-for-purpose solutions [25]. The four-step co-production approach adopted in this study, adapted from the iterative co-production framework as described by Hawkins et al. [26], was central to the development of the present intervention that reflected the realities of NCHD and HIPE practice. This methodology ensured that as well as being grounded in existing research and best practices, this approach was also sensitive to the culture of Irish hospitals and the needs of the NCHDs and administrative data coders that work within them. Previous documentation improvement initiatives have often been developed without engagement from the NCHDs expected to implement them, which may limit the intervention’s relevance and produce feelings of passivity in busy clinical environments [30]. In contrast, the iterative consultation process used in stage two to four of the present study allowed the intervention to be shaped by those directly involved in discharge documentation and coding. This process ensured that the final educational resources were concise, practical, and compatible with existing clinical workflows. The decision to present the material as a short educational video accompanied by a portable visual

aid was also informed by participant feedback, highlighting the importance of accessibility and time efficiency in educational interventions aimed at hospital doctors.

The findings further suggest that improving education on documentation quality may support more accurate recording of HAAEs within administrative datasets. Delirium, pneumonia, and urinary tract infections were selected for inclusion in this intervention as these conditions often require explicit documentation to enable accurate coding, particularly where their onset during hospitalisation must be distinguished from pre-existing diagnoses. Enhancing clinician awareness of the labels and terminology and prioritisation of the documentation practices that lead to HAAE coding through educational intervention may therefore contribute to improved capturing of these events within national hospital data systems [31]. Where HAAEs are under-recorded, their prevalence and associated costs may be underestimated, potentially limiting the ability of health systems to identify areas requiring quality improvement [32]. By strengthening the recording practices that underpin administrative data collection, educational interventions such as that of the present study may contribute to more reliable national datasets and targeted resource allocation within healthcare systems, as evidenced by Xu et al. [33].

Despite these positive findings, several limitations should be considered when interpreting the results of this study. The pilot evaluation was conducted within a single partnering hospital and involved a relatively small cohort of incoming non-consultant hospital doctors. As such, the findings primarily reflect whether the intervention was perceived to be useful and acceptable by its target audience, rather than measuring changes in documentation quality or national datasets. Further evaluation across multiple hospitals would be required to determine whether the intervention leads to measurable improvements in the recording of HAAEs within the health information system, however, the intervention is sufficiently flexible in terms of prescription of process to be adapted into the workflow of any hospital. Relatedly, the voluntary nature of participation may also have introduced self-selection bias, whereby participants with a particular interest in documentation quality or administrative data may have been more likely to engage with the study. Furthermore, acceptability findings were based on self-reported perceptions immediately following the intervention and may have been influenced by social desirability bias. Future studies should include objective assessments of changes in documentation quality and administrative data recording.

In addition, the study focused on a limited number of hospital-acquired adverse events. While delirium, hospital-acquired pneumonia, and urinary tract infections represent common and clinically significant complications, other conditions, such as pressure ulcers, may present similar documentation and coding challenges. Future research could explore whether the principles and methods of this intervention development could be operated within a broader range of diagnoses. Expanding the scope of the intervention may further strengthen the quality of administrative hospital data and support wider patient safety monitoring initiatives.

This study demonstrates the feasibility and value of a co-designed, multidisciplinary approach to improving discharge documentation and administrative data quality. By engaging both NCHDs and administrative data coders in the four-step educational intervention development framework, the project was able to address the gaps in knowledge and communication within the patient data production process and develop resources tailored to the needs of those involved. Continued collaboration between these professional groups may represent an important step toward strengthening the accuracy, transparency and value of national healthcare data.

Abbreviations

HIPE	Hospital In–Patient Enquiry
HAAE	Hospital Acquired Adverse Events
NCHD	Non–Consultant Hospital Doctors
AHD	Administrative Health Data

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Author contributions RM, AC, AM and MK contributed to the design of the work. RM and MK identified and approached experts in targeted groups. RM performed literature and policy reviews and undertook data collection and analysis. MK supported the analysis and interpretation of collected data. RM developed the manuscript, with editorial support from MK, AC and AM.

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Data availability The datasets generated and analysed during the current study are not publicly available due to the qualitative nature of the data and the need to protect participant confidentiality. Due to diversity in data production processes between healthcare settings, qualitative data describing processes cannot be fully anonymised without risk of identification of individuals or their specific places of work.

Declarations

Ethics approval and consent to participate Ethical approval for this sub-project was granted under a larger research project by both the Dublin City University Research Ethics Committee (DCU REC) and the participating hospital's Institutional Review Board (IRB), and complies with the Declaration of Helsinki. This study collected anonymised expert perspectives from a panel of healthcare professionals. It did not involve patient information, clinical interventions, or any personal health data. All participants provided informed consent prior to participation, which was opt-in, voluntary and anonymous, and no identifiable information was collected.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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