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## Original article

## Evaluating Quality of Care and Patient Safety with ICD-11: Opportunities for the French National Health Data System (SNDS)



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## ABSTRACT

Administrative health databases are widely used to evaluate healthcare quality and patient safety at the population level. In France, the French National Health Data System (SNDS) integrates hospital discharge data coded using the 10th revision of the International Classification of Diseases (ICD-10), enabling large-scale analyses of care pathways, outcomes, and health system performance. The transition to the 11th revision of the International Classification of Diseases (ICD-11) introduces structural and digital features that may modify how routinely collected data can be analyzed for quality and safety purposes.

This article describes how selected characteristics of ICD-11 could influence the use of SNDS for evaluating quality of care and patient safety. Four dimensions are examined: clinical representation through postcoordination and extension codes; the three-part model for describing healthcare-related adverse events; coding of diagnosis timing in relation to hospital admission and procedures; and risk adjustment using comorbidities, severity, and sequelae. For each dimension, practical coding examples are used to illustrate potential analytical implications for population-based indicators.

The analysis suggests that ICD-11 enables more explicit representation of clinical context, healthcare-related events, and temporal information within administrative data. These features may support more precise construction and interpretation of quality and safety indicators derived from the SNDS. The extent to which these possibilities translate into measurable improvements will depend on implementation conditions, including coding practices, training, and the integration of ICD-11 into existing information systems and analytical frameworks.

## 1. Introduction

Improving the quality and safety of healthcare requires valid measurement of adverse events and patient outcomes at the population level. Administrative health databases are key resources for such surveillance [1]. The French National Health Data System (SNDS) links hospital discharge data, outpatient claims, medication dispensing and mortality at

national scale, allowing researchers to follow patients across care settings and over long periods of time in France [2]. This potential has already been harnessed for studies on hospital performance, patient complications, and care trajectories, but it remains only partially realized because of inherent limitations in the underlying coding system [3].

The International Classification of Diseases (ICD), developed by the World Health Organization (WHO), serves as a global standard for

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coding, reporting, and analyzing health problems and health-related conditions. By providing a common language for health data, it ensures interoperability and comparability across healthcare information systems worldwide [4,5]. The ICD encompasses information on diseases, disorders, and other health conditions, facilitating global health surveillance and research. The hospital component of SNDS, the PMSI (Programme de Médicalisation des Systèmes d'Information, a DRG-like coded hospital discharge claims database), is currently based on ICD-10. Primarily designed to support hospital case-mix classification and reimbursement, PMSI-coded diagnoses are nonetheless extensively used in secondary analyses for epidemiological research, risk adjustment, and quality-of-care evaluation within the SNDS framework. Despite decades of epidemiological and financial use, ICD-10 was not originally designed with patient safety as a central objective. Adverse events related to care delivery are often difficult to distinguish from underlying disease, diagnosis timing is not explicitly captured, and comorbidities and severity are recorded with limited granularity [6]. Many patient safety indicators derived from ICD-10 data rely on complex algorithms and exclusions criteria to approximate hospital-acquired events, but they remain vulnerable to misclassification [7].

The latest revision of the International Classification of Diseases, ICD-11, reflects the most up-to-date medical knowledge and introduces clinically intuitive coding structures designed to assist healthcare providers, researchers, and policymakers [8,9]. Its transition represents a major step forward in improving the accuracy, consistency, and comparability of health data. As of May 2024, 132 Member States and regions are at various stages of implementation. Among them, 72 countries have initiated the adoption process, including translation efforts; 50 countries are conducting or expanding pilot implementation projects; and 14 countries and regions have begun collecting or reporting data using ICD-11 codes [10]. The 2024 version of ICD-11 also incorporates improved diagnostic details and advanced digital tools to better support global health information systems. Furthermore, ICD-11 embeds quality and safety considerations into the architecture of the classification [11]. It introduces the notions of stem codes, extension codes, and postcoordination in order to represent clinical reality more accurately. It also offers a dedicated three-part model for healthcare-related harm, explicit diagnosis-timing codes, and richer encoding of comorbidities and severity.

The objective of this article is to present how the specific features of ICD-11 can enhance the value of SNDS for quality and safety evaluation and research. We focus on four dimensions: level of clinical detail, the three-part model, diagnosis timing, and risk adjustment by comorbidities and severity. For each dimension, we provide practical examples that illustrate the potential impact on SNDS-based indicators and studies.

## 2. The granularity of clinical information enabled by extension codes and postcoordination

Postcoordination is a defining feature of ICD-11. It allows multiple codes to be combined into a structured “cluster” so that complex clinical situations can be represented without multiplying precoordinated categories. Two coordination operators structure these relationships. The “&” connector is used to append qualifying detail to a primary concept—for example, specifying severity, anatomical site, stage, or infectious agent. The “/” symbol, in contrast, expresses a causal or consequential link between two distinct clinical entities within the same cluster.

This mechanism can be viewed as an evolution of the dagger-and-asterisk convention used in ICD-10, where dual coding was possible to capture relationships between an underlying condition and its manifestation. However, that convention was limited to predefined pairings and did not provide a general framework for expressing more complex relationships. ICD-11 broadens and systematizes this logic, allowing relationships between conditions, causes, and contextual qualifiers to be represented in a structured and transparent manner.

Within this architecture, stem codes represent core clinical entities such as diseases, injuries, external causes, or healthcare-related events. Although they can stand alone, their descriptive capacity is enhanced when combined through postcoordination. Extension codes, drawn from Chapter X, add specification regarding etiology, severity, stage, histopathology, anatomical location, infectious agent, and other relevant qualifiers. In practice, a coder selects a stem code for the primary clinical concept and refines it using extension codes connected by “&”. When multiple stem codes are required—for instance to link a healthcare intervention to a resulting harm—the “/” symbol makes this relationship explicit.

Overall, ICD-11 provides a more flexible and expressive system than ICD-10 while avoiding an expansion of fixed categories. It also makes relationships between concepts visible in ways that were previously implicit or constrained. For the SNDS, this means that a single clinical scenario can be encoded with a level of precision and contextual detail that previously required dedicated registries or free-text documentation. Table 1 illustrates this added value with two examples.

In continuity with the example 2, child maltreatment is recognized by the WHO as a major public health issue, and large healthcare claims databases have become key resources for population-level research. Before ICD-11, researchers relied on ICD-10 codes to identify possible child maltreatment cases, but the system lacked sufficient specificity and no consensus existed on which codes to use. This inconsistency hindered comparisons across studies and countries and limited global understanding of child maltreatment [12]. ICD-11 addresses these gaps by introducing explicit, comprehensive codes for child maltreatment. Each main type of maltreatment (physical, sexual, psychological abuse, and neglect) can now be coded as confirmed or suspected, with added details on the nature of the assault, the perpetrator–victim relationship,

**Table 1**  
Postcoordination Examples.

<b>Conceptual Framework</b>
STEM CODE & EXTENSION CODE (Chapter X, causality, severity, localization, context, timing, etc.)
STEM CODE A / STEM CODE B (Relationship, causal or manifestation or consequences, etc.)
<b>Example 1</b>
Diffuse traumatic cerebral oedema (NA07.20)
Postcoordination:
<i>Has pupil reaction score</i>
Both pupils react (XC5K)
<i>Has Glasgow Coma Scale eye score</i>
One or both eyes opening to pressure stimulation (XC3H)
<i>Has Glasgow Coma Scale motor score</i>
Localising response to pressure stimulation (XC6J)
<i>Diagnosis confirmed by</i>
Diagnosis confirmed by imaging (XY9R)
<i>Has manifestation</i>
Concussion with loss of consciousness, intermediate duration of 6 hours to less than 24 hours (NA07.05)
<i>Associated with</i>
Victim of avalanche, landslide or other earth movements (PJ05)
<i>Activity when injured</i>
Organised sports and exercise during leisure time (XE5UF)
NA07.20 & XC5K & XC3H & XC6J & XY9R /NA07.05 /PJ05 & XE5UF
<b>Example 2</b>
Physical abuse (PJ20)
Postcoordination:
<i>Activity when injured</i>
Educational activity (XE729)
<i>Place of occurrence</i>
Preschool or kindergarten (XE9LH)
<i>Aspects of assault and maltreatment</i>
Gender of perpetrator, male (XE5YG)
Context of assault, neglect (XE90G)
<i>Associated with</i>
Fracture of clavicle (NC12.0)
PJ20 & XE729 & XE9LH & XE5YG & XE90G/NC12.0

perpetrator characteristics, and contextual factors. The inclusion of dedicated neglect codes marks a further improvement. By providing a standardized international framework, ICD-11 enables more accurate estimates of child maltreatment prevalence and burden, supports evidence-based policies and prevention strategies, and improves resource allocation. Its expanded coding and digital features strengthen global surveillance and health system management, offering a stronger foundation for addressing this critical child health issue.

In all these examples, the combination of stem codes, extension codes, and, when appropriate, the “/” link between stem codes, turns the coded data into a rich description of clinical reality. At SNDS scale, this would improve the precision of clinical and epidemiological surveillance, facilitate automated detection of rare or emerging events, and provide high-quality input features for artificial intelligence models applied to medico-administrative data.

### 3. The three-part model and coding of potential sequelae

The three-part model is an innovation of ICD-11 for representing healthcare-related adverse events. In practice, ICD-11 introduces new coding structures—primarily located in Chapter 23 (External causes of morbidity or mortality) and complemented by extension codes from Chapter X—that can be combined to describe events such as complications of surgery, medical device failures, medication-related harm, or accidents occurring in healthcare settings. Rather than mixing cause and consequence in a single diagnosis code, ICD-11 separates three elements: i) the cause of the injury or harm related to a healthcare activity health-care-related activity, ii) the mode or mechanism of harm which is related to the cause, iii) and the harmful consequence for the patient [13]. These elements are encoded as stem codes and then combined into a postcoordinated cluster.

The healthcare-related activity corresponds to what the health system did or intended to do: for example, performing a surgical procedure, administering a medicine, or implanting a device. The mode or mechanism describes how the harm occurred, such as overdose, underdose, wrong route of administration, mechanical failure of a device, contaminated product, or infection. The harmful consequence is typically a disease or injury that appears elsewhere in the classification, such as haemorrhage, sepsis, fracture, or organ failure.

By separating these components and then linking them, the three-part model makes causality explicit. It answers, in coded form, the question “what happened to the patient because of health care?” rather than simply recording the final clinical state. ICD-11 also includes rubrics for late effects or sequelae, which allow long-term consequences of prior diseases or procedures to be coded in a consistent way and, if desired, linked back to the original event.

ICD-11 additionally allows the representation of healthcare-related incidents without patient harm, sometimes referred to as no-harm or near-miss events. In such cases, coding rules permit the use of stem codes from Chapter 23 to describe the healthcare-related activity and the mode or mechanism of the incident, without assigning a stem code for a harmful consequence. The explicit absence of a consequence code indicates that no injury or disease resulted from the event. While this capability is highly relevant for structured incident reporting systems and learning health systems, such no-harm events are not currently identifiable within SNDS-based analyses, which rely on coded diagnoses and outcomes recorded in medico-administrative data.

The Table 2 provides some clinical scenarios showing how these new features can be used.

The three-part model enables direct measurement, within the SNDS, of harms causally related to healthcare activities, rather than relying on proxies. It also supports longitudinal analyses of sequelae and late effects, which are particularly relevant for chronic diseases and oncology.

**Table 2**  
Three-Part Model and Sequelae examples.

Conceptual Framework
Three-part model :
STEM CODE / PK CODE (Chapter 23, causes of the harm) / PL CODE (Chapter 23, modes of the harm)
Sequelae
STEM CODE / Late Effect CODE (Chapter 24, QC50 Code or code from the body system chapters) / STEM CODE (prior condition)
<b>Example 1</b>
Mr. Martin was admitted to the intensive care unit with acute sepsis and septic shock occurring three days after right total hip arthroplasty. Investigations revealed an acute bacterial infection of the right hip joint, involving the prosthetic implant, with blood and joint cultures positive for <i>Staphylococcus aureus</i> . The infection was attributed to failure of sterile precautions during the surgical procedure, leading to postoperative contamination of the orthopaedic device.
Stem Code: Sepsis with septic shock (I G41)
Postcoordination:
<i>Other postcoordination</i>
Postoperative (XY7V)
<i>Has causing condition</i>
Bacterial infection of joint (FA10.0)
<i>Laterality</i>
Right (XK9K)
<i>Specific anatomy</i>
Hip joint (XA4XS4)
<i>Infectious agent</i>
<i>Staphylococcus aureus</i> (XN6BM)
<i>Course</i>
Acute (XT5R)
<i>Associated with</i>
Orthopaedic devices associated with injury or harm, prosthetic or other implants, materials or accessory devices (PK99.2)
Failure of sterile precautions, as mode of injury or harm (PL11.4)
<b>1G41 &amp; XY7V / FA10.0 &amp; XK9K &amp; XA4XS4 &amp; XN6BM &amp; XT5R / PK99.2 / PL11.4</b>
<b>Example 2</b>
Hemiplegia (MB53.Z)
Postcoordination:
<i>Has causing condition</i>
Late effects of cerebral ischemic stroke (8B25.0)
<b>MB53.Z / 8B25.0</b>

### 4. The coding of diagnostic timing

A long-recognized challenge in using administrative data for quality assessment is distinguishing conditions present on admission from those that arose during the hospital stay. Many quality indicators hinge on this distinction. For example, a case of pneumonia that develops after admission is a potential healthcare-associated complication, whereas pneumonia present on admission is not attributable to hospital care. Under ICD-10 in PMSI, coders identify a principal diagnosis and can flag associated diagnoses as comorbidities or complications. However, ICD-10 itself does not have a standardized, universal indicator for each diagnosis’s timing relative to admission. Implementing present-on-admission flags required separate coding systems or national-level guidelines (as was done in some countries). This limitation often forced researchers to use surrogates or incomplete methods to infer timing, which could misclassify hospital-acquired conditions or include pre-existing conditions in complication rates.

ICD-11 directly addresses this issue by incorporating diagnosis timing codes as part of its postcoordination scheme [14]. In the ICD-11 morbidity coding guidelines, a set of extension codes is designated to indicate the timing of a diagnosis in relation to the episode of care (Table 3). Together, these timing flags create a standardized way to label each diagnosis in a discharge record with when it happened, which is valuable for safety monitoring. When these timing extension codes are used systematically, they transform the interpretation of hospital data. A coder can make explicit, for each diagnosis, whether it should be treated as a baseline risk factor or as a potential outcome of care. For SNDS, this

**Table 3**  
Timing Extension Codes in ICD-11.

Type	Code and description
Timing of diagnosis	XY6M – Present on admission
	XY69 – Occurred after admission
	XY85 – Timing uncertain
Timing in relation to surgery	XY9U – Preoperative
	XY9N – Intraoperative
	XY7V – Postoperative

simplifies the construction of nosocomial and iatrogenic indicators and reduces the need for indirect inference methods.

For SNDS, diagnosis-timing extension codes have several consequences. They make it possible to identify complications that are reliably hospital-acquired, they simplify the exclusion of conditions present on admission in the definition of patient safety indicators, and they make inter-hospital comparisons fairer by separating the burden of comorbidities from the complications attributable to care.

## 5. Risk adjustment

Beyond individual complications, evaluating quality of care often requires understanding the overall case-mix and patient severity. Patients with multiple comorbidities or severe illness are at higher risk of poor outcomes, and good surveillance must adjust for this to avoid unfair comparisons. Administrative data are frequently used to calculate comorbidity indexes (such as administrative data derived Charlson or Elixhauser comorbidity indexes) to risk-adjust mortality or readmission rates [15]. The utility of these indices depends on the completeness and accuracy of coding all relevant comorbid conditions. ICD-11 is poised to improve the capture of comorbidities and severity in a few important ways. Its increased clinical granularity, together with the possibility of incorporating severity through extension codes (e.g., NYHA class, tumor stage, functional scores), enables more refined measurement of comorbidity and severity indices traditionally used for adjustment [16]. In addition, accounting for sequelae of previous health events can improve adjustment models, as these sequelae may increase both clinical risk and healthcare expenditure [17]. The explicit recording of diagnostic timing also enhances adjustment accuracy by distinguishing conditions present at admission from complications arising during hospitalization. Only the former should be included in risk adjustment [14]. Finally, the integration of socioeconomic determinants via ICD-11 Chapter 24 (Factors influencing health status or contact with health services) opens new opportunities to strengthen equity in quality indicators. The Table 4 provides an example illustrating how the application of timing codes may affect adjustments in Hospital Mortality Ratios.

For analyses using the SNDS where rigorous risk adjustment is critical, the transition to ICD-11 is likely to yield substantial improvements. The increased coding granularity will better differentiate between the patient's intrinsic clinical risk and complications arising from the quality of care delivered during hospitalization. Under current coding practices, certain iatrogenic events or in-hospital complications may be misclassified as pre-existing conditions, which can obscure performance differences between hospitals and reduce the ability of indicators to detect true variations in quality and safety. By correcting this bias, ICD-11 paves the way for evaluation methods that are fairer, more transparent, and therefore more acceptable to healthcare professionals, institutions, and policymakers.

## 6. Discussion

ICD-11 has been designed with the perspective of collecting data on quality and safety of, and its architecture reflects this ambition. The

**Table 4**  
Risk Adjustment Example.

<p><b>Simulated Framework:</b> Consider a quality measurement system comparing hospital mortality among patients admitted for acute decompensation of chronic heart failure. In the literature, in-hospital mortality is approximately 5% when no iatrogenic acute kidney injury (AKI) occurs, and 20% when such a complication arises during hospitalization.</p> <p>In a given hospital, observed mortality is 6.4%, and the rate of iatrogenic AKI is 10%, suggesting a potential quality issue. These AKI events are coded in the PMSI but, by definition, are not present at admission.</p> <p><b>Scenario 1 (ICD-10):</b> Without considering timing, AKI is treated as if it were a pre-existing comorbidity.</p> <ul style="list-style-type: none"> <li>Expected mortality = <math>0.90 \times 5\% + 0.10 \times 20\% = 6.5\%</math></li> <li>Observed/Expected ratio = <math>6.4 / 6.5 = 0.98</math></li> </ul> <p><b>Scenario 2 (ICD-11):</b> Timing is captured, and AKI acquired during the stay is excluded from risk adjustment.</p> <ul style="list-style-type: none"> <li>Expected mortality = 5%</li> <li>Observed/Expected ratio = <math>6.4 / 5 = 1.28</math></li> </ul> <p><b>Interpretation:</b> In the first scenario, no alert is triggered, and the hospital appears to perform adequately. Using the new feature of ICD11, a meaningful alert is triggered, indicating excess mortality.</p> <p>This example illustrates that distinguishing whether a diagnosis is “present at admission” is essential to calculate standardized mortality indicators correctly and to avoid masking quality-of-care issues.</p>
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dimensions discussed here illustrate how the classification can enhance the use of SNDS for quality and safety research. Stem code, extension and diagnosis-timing codes, and postcoordination provide richer clinical detail than ICD-10 and allow differentiation between comorbidities and complications. The three-part model explicitly captures healthcare-related harm, while refined comorbidity and severity coding enables more accurate risk adjustment.

These innovations are particularly valuable in a national system like SNDS, where vast data are available but the quality of inferences depends on coding granularity and consistency. Improved codes lead to better indicators, more transparent evaluations of hospital performance, and more informative studies of patient safety. They also foster a stronger foundation for artificial intelligence. Machine-learning models built on ICD-11-encoded data benefit from clearer input variables and better labelled outcomes, which can facilitate clinical validation and adoption of AI tools.

Implementation poses significant challenges [18]. While ICD-11 provides a promising new way to capture healthcare-related harm or injury, historically such adverse events have been underreported in administrative coding [3,19]. ICD-11 provides the tools to encode cause and mechanism of harm, but their usefulness as epidemiological indicators will depend on coding practices. Coding an adverse event often requires that the clinician's documentation clearly links an outcome to a healthcare cause, and that the coder has sufficient training and incentive to record it. As part of implementing ICD-11 in the SNDS, therefore, it would be wise to update coding guidelines, train clinical coders on the new adverse event codes, and perhaps integrate automated checks or prompts (e.g. if a known complication like wound infection is coded, prompt addition of the cause/mechanism codes). Training coders and clinicians in the logic of postcoordination, the use of extension codes is also essential. National coding guidelines must specify when and how to apply these features, particularly for quality and safety-relevant scenarios, in order to ensure consistent practice across hospitals. Software and PMSI tools need adaptation to support ICD-11 clusters, including user-friendly interfaces for selecting and linking stem codes and extension codes, as well as internal checks to prevent contradictory combinations [18,20,21]. The WHO Coding Tool (accessible here [https://icd.who.int/ct/icd11\\_mms/en/release](https://icd.who.int/ct/icd11_mms/en/release))—freely available online and designed for integration into local coding software—provides structured postcoordination support, natural-language search functionality, and embedded

coding rules that can facilitate implementation within existing hospital information systems.

A potential concern relates to the impact of ICD-11 on coding workload. In a Canadian pilot study, Eastwood and colleagues reported that ICD-11 coding time initially exceeded ICD-10 benchmarks but declined substantially over nine months as coder proficiency increased, decreasing from 23.6 minutes per chart to 9.9 minutes—ultimately below typical ICD-10 averages of 15–20 minutes per chart [22]. This improvement may reflect both learning effects and the design of ICD-11 itself. The classification is more closely aligned with clinical reasoning, and its deployment alongside the WHO Coding Tool may facilitate efficient navigation once familiarity is achieved. Nevertheless, the real-world impact on coding duration remains context-dependent and warrants further implementation studies.

Although several examples presented in this article are illustrated using acute care and short stays hospital scenarios (PMSI MCO), they are not specific to that setting. These functionalities extend to rehabilitation (SMR), psychiatric care, hospital-at-home programs (HAD), long-term care facilities, and ambulatory settings. In each of these contexts, the ability to represent causal chains, harm attribution, severity, and temporal relationships in a structured manner may strengthen the consistency and interpretability of quality-of-care analyses.

While this article focuses on ICD-11, its implications should be considered within the broader WHO Family of International Classifications, which has undergone substantial modernization in recent years. The International Classification of Functioning, Disability and Health (ICF), updated to align more closely with the common WHO classification foundation, provides a structured description of functioning and contextual factors across care settings. The International Classification of Health Interventions (ICHI), recently finalized following its beta development phases, offers a standardized framework for reporting health interventions across hospital, ambulatory, rehabilitation, mental health, and public health contexts. Developed within a shared conceptual architecture and using harmonized extension codes, ICD, ICF, and ICHI together form a coherent semantic infrastructure that supports integrated analyses of health conditions, interventions, and outcomes across sectors of care.

Beyond hospital discharge data, the full potential of ICD-11 for quality and safety research will depend on its adoption across multiple health data sources. In France, several existing datasets could benefit from transitioning to ICD-11 and aligning their coding frameworks. These include mortality data derived from death certificates, which are already integrated into the SNDS and currently coded using ICD-10, but would directly benefit from the enhanced causal structure and postcoordination capabilities of ICD-11. In addition, clinical cohort data, some of which are already linkable to the SNDS, could gain from a harmonized ICD-11-based representation of diagnoses, severity, and sequelae, improving comparability across data sources and over time. Structured adverse event reporting systems represent another important, yet currently disconnected, source of safety-related data. While these databases are not presently linked to the SNDS, ICD-11 offers a shared semantic framework—particularly through the three-part model—that could facilitate future interoperability between incident reporting systems and medico-administrative data.

Finally, the transition period will require careful methodological work. Researchers will need to bridge ICD-10-based historical data and new ICD-11-based SNDS data, develop mapping strategies, and assess how coding changes affect long-term trends in quality and safety indicators. Pilot studies in a limited number of hospitals, using dual coding in ICD-10 and ICD-11, could help quantify these effects and refine algorithms before nationwide implementation [20,23–25].

## 7. Conclusion

The implementation of ICD-11 constitutes a major opportunity to transform the analytical capacity of the SNDS in the fields of healthcare quality and patient safety. By allowing a more granular clinical

description, the explicit documentation of adverse events and their causal relationships, and a clear distinction between pre-existing conditions and hospital-acquired complications, ICD-11 introduces a conceptual and methodological advance that can substantially improve the validity and interpretability of medico-administrative data. These features provide a foundation for more precise risk adjustment, enhanced surveillance of safety indicators, and the generation of new evidence to inform quality improvement strategies. Ultimately, integrating ICD-11 into SNDS analyses should improve the relevance of quality indicators, support more equitable pay-for-performance mechanisms, and reinforce the trust of institutions, healthcare professionals, and the public in these measurement systems. However, realizing this potential will depend critically on the conditions under which ICD-11 is implemented. In France, where national deployment is currently envisaged toward 2030, this transition will require coordinated adaptation of information systems, case-mix grouping mechanisms, and coding practices within the PMSI framework. Ensuring methodological continuity, adequate training, and appropriate alignment between financing and quality objectives will be essential to fully harness the transformative capacity of ICD-11.

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