SOUTH AFRICAN MEDICAL ASSOCIATION CODING COMPASS

SOUTH AFRICAN MEDICAL ASSOCIATION

UNITING DOCTORS FOR THE HEALTH OF THE NATION

Foreword

by Claude Ndlovu, Head of Professional Affairs, South African Medical Association Coding Unit

The release of the first edition of *The Coding Compass* marks a defining moment in the evolution of clinical coding in South Africa. For decades, clinical coding has remained a largely invisible but vital part of our healthcare system — underpinning everything from billing and health system planning to policy evaluation and health research. Yet, it has often been undervalued, under-resourced, and poorly understood.

With the National Health Insurance (NHI) on the horizon, the importance of robust, standardized, and well-governed clinical coding practices has never been greater. As South Africa embarks on this historic transformation, we need to build a new generation of coders, clinicians, and health system leaders who understand the power and purpose of clinical coding. This magazine is a step towards that future.

The Coding Compass is not just a publication — it is a platform for learning, for dialogue, and for community-building. It offers insights from seasoned experts, showcases practical tools, unpacks key reforms, and creates space for emerging voices. Whether you are a clinical coder, a doctor, a policymaker, or a student, this magazine will help you navigate the fast-changing landscape of healthcare data and coding.

As Head of Professional Affairs at the South African Medical Association, I am proud to endorse this initiative. I would like to thank all contributors — writers, editors, partners, and our incredible community — who have made this possible. Your work is lighting the path forward.

Let *The Coding Compass* guide us as we move towards a more equitable, efficient, and accountable healthcare system.

Claude Ndlovu

Contents

# Challenges and solutions in clinical coding accuracy and efficiency

by Maria Mphahlele from Medscheme

My opinion piece has been based on a personal experience, that for me reaffirmed the value of coding accuracy and efficiency within the South African healthcare environment. In my journey within Managed Care in the Private Healthcare sector, I was working for a company operating as a Managed Care Organisation (MCO). An employee was walking past my desk when they observed my many coding books on my desk. They bemoaned that they could never understand how anyone can be happy doing such a boring unfulfilling job. They further went on to express that they could not fathom ever seeing themself doing such a non-stimulating job. I bit my tongue, said a little prayer to ensure that my response was diplomatic. Yes, I had an opinion, I could not say it because I was new in the organisation and thus challenging the status quo could have been a career limiting move; I should know which side my bread is buttered.

At a CMS appeals hearing that I was privileged to attend, an Allied health care provider had lodged a complaint which was approved but my company subsequently appealed. They commented that their colleagues can charge whichever code in the coding guide, if it existed. There was no understanding of the decorum needed in respect of responsible utilisation of clinical code, nor any insight into coding principles and coding rules and guidelines. My coding gloves came off but in a professional way; and when the judgement was made, I won the appeal on behalf of my company.

Regarding my previous colleague's comment, opposing words were copious in my head, and this opinion piece has afforded the opportunity to pen them. Some of them were, how do you risk manage your company's claims! MCO's are responsible for authorising hospitalisation requests for sick members who expect their hospital and related claims paid, for services rendered by private hospital facilities and health care providers. Facilities and providers use clinical codes to submit their claims, a language that should be known by all those who use it at least. This is a language that enable MCO's to pay millions of Rands daily and yet the work is considered boring and unfulfilling. At the end of the day we are answerable to the schemes we manage, the shareholders as well as most importantly the members of the schemes and patients. Someone must do the boring coding job to ensure that coding guidelines and principles are adhered to by all to ensure sustainability of medical schemes. Unfortunately, the sentiments expressed to me previously are not that of a lone wolf in this type of thinking. Coding is not taken seriously but when queries arise, they request coders to assist for the query to be resolved. Yet, only a few will say thank you that it now makes sense.
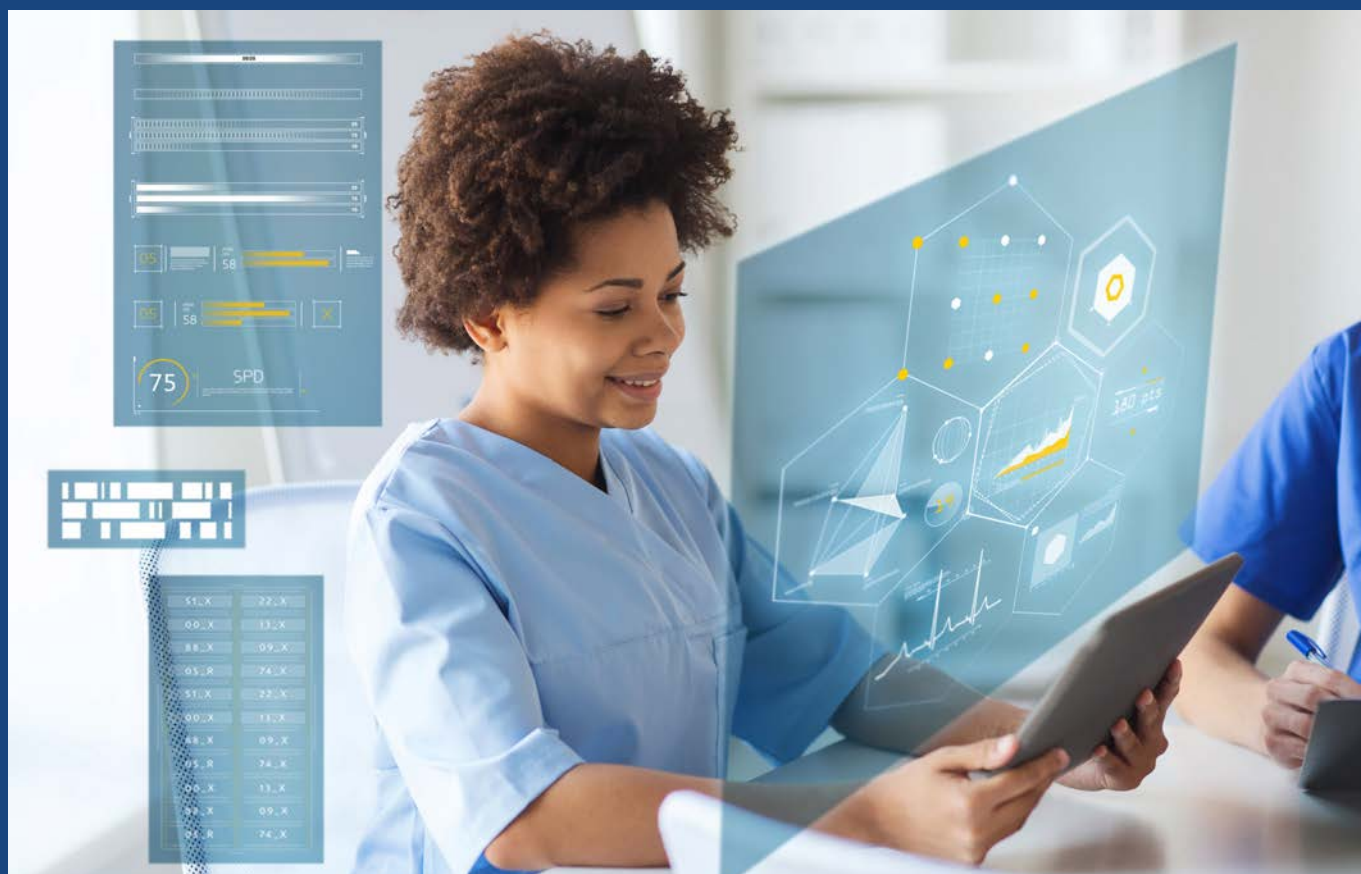
In South Africa, health care professionals enter the private sector without understanding the rules of the game, clinical coding being one of them. Professionals know that they can claim for their services, but they have no understanding of the processes. It was mind boggling to hear that any code can be claimed without following the rules by the allied health care provider. My impression of CMS at the appeals hearing was that they themselves do not have the expertise to rule on coding matters that are not PMB related. They also use the RPL guide as their ultimate reference but forget that they are only the custodian of the guides. Procedures and Relative Value Units in the guide are the responsibility of the medical doctors and allied health care professionals that perform the procedures, not CMS. As a result, they make rulings which are sometimes not aligned to the intention of the codes. There is a need to professionalise clinical coding in South Africa. There is also a need to listen to professional coders that are familiar with the coding rules guidelines and principles.

In conclusion, the South African private health care sector and regulators must take clinical coding seriously. There must be willingness to formally learn from countries whose clinical coding has been embedded in the system and it is working effectively and use these as mentors regarding how best to professionalise the sector in RSA. Correct coding allows for efficient claims processing, accurate coding leads to quicker claims processing and fewer rejections, benefiting both providers patients and funders. Clinical coding helps maintain accurate patient records, reducing inconsistencies and errors, thus accurate data within the organisation. Coded data supports meaningful analysis for research and quality improvement initiatives. MCO would not be able to enter payment contracts with health care facilities and providers if codes and coders did not exist. Clinical coding is a claims risk management tool.

A career in the healthcare industry as a medical coder offers personal, professional, and financial reward, as well as unlimited opportunities to advance in a profession you can be proud of.

Coding as a Language: Introduction

Dr CD Mashiloane

On the 1st October 2024 the government gazette published a proposal of new healthcare terminological systems.

The government gazette states quite clearly that the purpose of the proposed terminological system is to enable effective communication of healthcare knowledge or transfer health-related data or creating a technical language that allows communication using shared terminology. The government gazette also briefly states that these proposed terminological systems are aimed at improving "natural language processing", text mining and analytics of health-related terminology.

This government gazette is important in setting an important foundation for better understanding of coding and dismissing the distorted way of looking at coding from a narrow perspective of reimbursement.

Understanding coding

It is important that one understands the following concept in order to get a broader view on coding

- What is communication?

- What is the medium of communication in coding

- Natural language

- Natural Language Processing

- Functions executed in coding

- Application of coding in other systems

a. What is communication

Communication has traditionally been defined a "encoding" and "decoding".

"Encoding" is transformation of data into a format that is usable by the receiver for execution of designated function.

"Decoding" is transforming information back to its original format for interpretation and understanding.

While "encoding" has the same meaning in Artificial intelligence as natural communication, "decoding" differs from meaning in Artificial intelligence, where it is defined as transforming data from a machine code into a readable format.

b. The medium of communication in coding

The word coding or code comes from "codex", a word originally of Proto-italic origin which means "to etch or cleave on wood", i.e. wooden tablet. The wooden tablet is the origin of the modern book format.

It is that important to note that the "codex" was developed at the time where scrolls was the dominant form of recording information. The shift from scrolls to a codex was enabled by a demand for better organization of information that allows easy retrieval, and most importantly for a format that was both "portable and interoperable" and easily to preserve at lower costs.

Thus the core of "coding" is the writing of information, organised in a manner that is easily retrievable by the receiver to enable execution of designated function.

c. Natural language

It is important to understand that the source of coding is natural language or ordinary language, i.e. how ordinary people speak to each other a daily basis. If we to address the needs of ordinary people, it is important to understand the content and structure of ordinary language, which the sources of their needs.

Language consists of words, and words consists of sentences.

The are two main type of words, "content words" and "function words".

Content words are the "building blocks" providing the specifics of what is being discussed. Content words, in linguistics, are words that possess semantic content or substance and contribute to the meaning of the sentence in which they occur, while "function words" serve only grammatical purpose.

Content words contrast with function words, which have very little substantive meaning and primarily denote grammatical relationships between content words, such as prepositions (in, out, under etc.), pronouns (I, you, he, who etc.) and conjunctions (and, but, till, as etc..

Therefore it is the content words that are important is for storing and communicating for our needs

The content words are broadly structured as following:

SUBJECT, VERB, OBJECT (and their ADVERBS or ADJECTIVES)

When a content word is used on its own, and conveys meaning, it does convey an executable meaning. When content words are used together, i.e. as SUBJECT, VERB, OBJECT (or sentence form), they enable execution of needs. A sentence in linguistics is referred to a "complete thought.

Thus, creating a sentence structure is the foundation of coding, as it enables execution of designated function.

d. "Natural language processing"

While the term "natural language processing (NLP) is now associated with Artificial Intelligence, the term originates from communication, in that effective communication requires processing of natural language by the sender in order to enable the receiver to execute without the receiver being required to process the information (i.e. understand or interpret). However, the receiver can understand, should he or she wish, by decoding the information, i.e., transform the information back to its original form.

Coding is" natural language processing" in that it requires processing, translation or transforming language into an" artificial language" that uses shared terminology.

e. Functions that can be executed for coded information

These functions are the following:

- Facilitation of statistical analysis (x, y, z etc) i.e. looking for correlations and associations (not causation), predict costs (actuarial calculations)

- Easy storage of information

- Easy transmission or retrieval of information

- Automated decision-making

- Other applications of coding

The medical community seems to forget that coding is not solely used in the healthcare industry, but is applied in other industries as well.

While in contemporary discourse, coding is commonly associated with artificial intelligence, it is also associated with other forms of communication, like the Morse codes, military codes, cryptography, but most importantly, the civil codes, i.e. the origin of what we currently refer to as legislation, law written in a structured format.

French civil code

The similarity between medical coding and the French civil code, which is the "first fully codified legal system" of the modern world, are two hard to Ignore. In 1804, the French Civil code became the Main influence of 19th century civil codes in Europe. Civil codes stresses clearly (verified, logical, no jargon or vague words) written and accessible laws based on a national language. The entire legal system (including private law) is written system by system as one body and each rule "codified"

To "codify" means t to reducing a law to a code using alphanumerical order e.g. Section 1 a(i). Hence the word "code "then more closely to writing laws in structured format using alphanumerical system to enable to receiver to be able to retrieve easily and execute the law without the need for much processing or understanding.

Military codes

Military code words are used to improve communication, ensure security, and reduce ambiguity in real-time situations, especially during deployments. These can include acronyms, abbreviations, or phrases with specific meanings that are understood by those in the military. Common examples include "Roger," "SNAFU," "Charlie Mike," and "O Dark Thirty".

Artificial intelligence (Computer code)

Coding is Computer programming languages, developed through a series of numerical or alphabetic codes, instruct machines to complete specific actions towards a goal.

Computer coding functions much like a manual....

The word "Program" is from the 1630s and originally meant "public notice," from Late Latin

programma or "proclamation, edict," from Greek "programma" was used to refer to a written public notice."

Conclusion

Just merely seeing coding through a reimbursement system distorts coding entirely

Coding is for effective and efficient communication in whatever setting.

Coding is key to effective health care planning and efficient allocation of resources in that it enables sharing of information effectively and efficiently to enable the health needs of society to be addressed.

Dr Conrad Mashiloane

SAMA Specialist Practice Committee Chairperson

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The impact of emerging technologies on clinical coding practices

by Stephanie Fourie

Clinical coding lies at the heart of modern healthcare systems across the globe, turning raw clinical data into standardised codes that support everything from patient care to billing.

While this field has traditionally relied on meticulous manual work, emerging technologies are transforming the way clinical coding is approached, making it more efficient, accurate, and insightful. To my mind, the impact of these technologies on clinical coding practices is nothing short of revolutionary.

Smarter, faster coding with artificial intelligence

One of the most significant developments is the integration of artificial intelligence (AI) and machine learning (ML), which enables coders to work faster and with greater precision. For example, AI-powered natural language processing (NLP) tools can analyse unstructured clinical documentation, such as physicians' notes, and automatically generate appropriate codes. This capability drastically reduces the time required for coding and minimises the risk of errors.

These technologies do more than speed up coding – they learn and adapt. Over time, these technologies can identify patterns and nuances in coding practices that would take far longer to achieve manually, and when this data is fed back into these systems their accuracy improves even further. For instance, they can flag discrepancies between a diagnosis and assigned codes, prompting coders to make necessary

corrections. In my opinion, this level of oversight will help maintain the integrity of clinical data, which is critical for decision-making across healthcare organisations.

Automation redefines the coder's role

Beyond AI, automation tools like robotic process automation (RPA) are also gaining ground. These systems can handle repetitive tasks such as data entry and code verification, freeing up coders to focus on more complex and interpretive work that requires human judgment. It's a shift from manual labour to strategic thinking, something that I believe elevates the coder's role within healthcare teams.

Cloud-based platforms and interoperability solutions, like Discovery Health's HealthID platform, are also reshaping how coded data is accessed and shared. For example, when a patient transitions from a primary care provider to a specialist, these systems ensure that their coded medical histories seamlessly follow, improving continuity of care and cutting down on duplication. This level of interoperability improves patient outcomes and reduces administrative redundancies.

Stephanie Fourie *is a Clinical Coding Specialist, Discovery Health. She is a seasoned Clinical Coding Specialist with 26 years of experience. She has dedicated her career to working on and supporting professional billing coding applications, both locally and internationally.*

Navigating challenges

Of course, these advancements bring their own challenges. Implementing emerging technologies requires substantial investment in infrastructure and training. Healthcare organisations must ensure that coders are equipped with the skills to work alongside AI tools and navigate new systems. There's also the issue of standardisation – integrating with existing systems like ICD-10 or ICD-11 can be a complex and time-consuming.

Ethical considerations also come into play. For example, if an AI system generates an incorrect code that leads to a billing error or affects patient care, who is accountable? Striking the right balance between automation and human oversight is, in my view, essential to address these concerns.

Privacy and data security are at the forefront of discussions about emerging technologies in clinical coding. As more data moves to the cloud and becomes accessible through interoperable systems, robust safeguards are needed to protect sensitive patient information. Compliance with regulations like the Protection of Personal Information Act (POPIA) is non-negotiable in this regard.

For more on the challenges and solutions in clinical coding accuracy and efficiency, read the article by Luisa Whitelaw (Head of Clinical Coding Intelligence International, Discovery Health and Vitality) also in this journal

A future driven by technology and collaboration

Despite these challenges, the potential benefits of emerging technologies far outweigh the drawbacks. Enhanced accuracy, greater efficiency, and improved interoperability will contribute to stronger healthcare systems. In my mind, it's not just about making coders' jobs easier, it's about enabling better patient care, smarter policies, streamlined operations, and more responsive systems overall.

Looking ahead, the future of clinical coding is undoubtedly intertwined with technological advancements. As AI and automation continue to evolve, we can expect coding practices to become even more integrated into the broader healthcare ecosystem. These technologies will not only support coders but also enable them to play a more strategic role in shaping healthcare decisions.

In conclusion, while the road ahead comes with challenges, the potential for innovation is vast. AI and automation will redefine what's possible in clinical coding. As technology continues to advance, clinical coding will undoubtedly remain a cornerstone of healthcare, continually adapting and evolving to meet the needs of an increasingly digital world.

Challenges and solutions in clinical coding accuracy and efficiency

by Luisa Whitelaw

Clinical coding is a cornerstone of modern healthcare, translating medical diagnoses and procedures into standardised codes.

Clinical coding is a cornerstone of modern healthcare, translating medical diagnoses and procedures into standardised codes. Excellence in clinical coding has far-reaching consequences, supporting everything from billing and reimbursement to patient care, research, and policymaking. However, achieving accuracy and efficiency in clinical coding is no small feat – it comes with its own set of challenges, along with innovative solutions.

The challenge of complex documentation

Let's start with one of the most significant hurdles, one that people in my line of work deal with daily: the complexity of medical documentation. Inconsistent formats, variable levels of detail, and diverse terminology all contribute to a tough coding environment. Coders must interpret clinical language, often under pressure, and ensure each piece of information is coded correctly.

But what happens when documentation is incomplete, ambiguous, or inconsistent? In my experience, this can lead to coding errors which can result in billing inaccuracies, denied claims, or flawed data analysis.

Keeping up with changing standards

A related challenge is keeping pace with evolving coding standards. Coding systems like the International Classification of Diseases (ICD) and Current Procedural Terminology (CPT) are periodically updated to reflect advancements in medicine and technology. For example, the transition from ICD-10 to ICD-11 will introduce thousands of new codes and more granular specificity. While these updates enhance the accuracy of coding, they also require extensive training and adaptation for coders.

Coder fatigue and workload pressure

Additionally, coder fatigue is a very real issue. Clinical coding is a detail-oriented task that demands unwavering focus. In high-pressure environments like busy hospitals, coders often face tight deadlines, large volumes of work, and repetitive tasks. From where I stand, this kind of pressure can quickly affect both accuracy and efficiency.

Communication gaps with clinicians

Coders often work independently from clinicians, which can result in a lack of clarity about the medical information being coded. For instance, a coder might encounter a diagnosis that lacks supporting details or specific documentation about procedures performed. Without close collaboration with clinicians, coders may struggle to resolve these ambiguities.

While emerging technologies offer exciting solutions, they can also introduce complications. Tools like artificial intelligence and natural language processing (NLP) can improve speed and accuracy but adopting them isn't always straightforward. There's a learning curve, financial investment, and sometimes a sense of uncertainty about whether these tools will replace human roles.

Practical steps forward

Fortunately, solutions to these challenges are evolving just as rapidly as the field itself.

Luisa Whitelaw *is the Head of Clinical Coding Intelligence International, Discovery Health & Vitality. Luisa has 26 years of experience as a Clinical Coding Specialist with deep working knowledge of local and international terminologies, and their critical role in global healthcare*

Challenges brought by emerging technologies

From my perspective, the path forward is about empowerment — giving coders the tools, trust, and teamwork they need to do their jobs well. The result? Better data, better care, and better outcomes for everyone.

Enhancing documentation, training and tech adoption

A key solution is better documentation. Healthcare providers can adopt standardised templates and workflows for documenting patient encounters. Training clinicians on the importance of detailed and accurate documentation can bridge the gap between medical language and coding requirements. In my experience, when clinicians and coders collaborate, the quality of coding improves.

A key solution is better documentation. Healthcare providers can adopt standardised templates and workflows for documenting patient encounters. Training clinicians on the importance of detailed and accurate documentation can bridge the gap between medical language and coding requirements. In my experience, when clinicians and coders collaborate, the quality of coding improves.

With coding standards continuously evolving, coders need access to regular training sessions, workshops, and certification programs. For example, preparing for ICD-11 with focused training can prevent disruption and build coder confidence.

Leveraging automation will prove helpful in combating coder fatigue and boosting efficiency. Robotic process automation (RPA) and AI-powered tools can handle repetitive tasks like code validation or data extraction, allowing coders to focus on complex cases that require human judgement.

Improving collaboration and managing change

Creating feedback loops and communication channels between coders and clinicians can dramatically reduce misunderstandings. I've seen the impact of regular team check-ins or shared digital platforms — it's often the missing link in achieving better coding accuracy.

For organisations looking to integrate emerging technologies, change management strategies are crucial. Educating staff about the benefits of new tools, addressing concerns about automation, and providing hands-on training can ease the adoption process. These steps ensure that technology serves as an ally rather than a source of disruption.

Ensuring compliance and security

Finally, with more digital data and cloud-based tools, safeguarding information is non-negotiable. Organisations must invest in robust cybersecurity measures and adhere to regulatory frameworks to protect sensitive patient data. Building trust around the use of coded data will enable healthcare providers to harness its full potential without compromising privacy.

A smarter path to better coding

Clinical coding isn't just a technical task, it's a vital function that affects the entire healthcare ecosystem. While the challenges are real, so are the solutions. By improving documentation, investing in training, encouraging collaboration, and integrating supportive technology, we can build systems that are more accurate and more efficient.

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More details will be landing in your inbox soon!

Get ready to collaborate, challenge, and co-create. **Let's elevate healthcare, together.**

Warm regards,
The SAMA Leadership Team

Personal Reflections on Challenges, Solutions and the Future of Medical Coding

by Dan Schwebach, Senior Vice President at the AAPC

In my role at AAPC, I have had the unique opportunity to experience medical coding from a global perspective and talking with medical coders from around the world have gained an appreciation for the universal challenges we face regardless of geography, and immense potential, that lies ahead.

Clinical coding, though largely hidden behind the curtain of patient care, is the fundamental backbone of healthcare data and has real-world consequences. Coding determines reimbursement, shapes public policy, drives medical research, and ultimately affects patient outcomes. And yet globally, achieving both high accuracy and high efficiency remains one of our industry's most pressing dilemmas.

One of the most persistent challenges is the quality of clinical documentation itself. Coders often face documentation that is incomplete, vague, or inconsistent.

When a physician uses ambiguous terms or omits critical details, the coder must either make judgment calls or initiate time-consuming queries. This introduces both financial risk and risk to patient care.

To address this, one of the most effective solutions is strengthening Clinical Documentation Improvement (CDI) programs. Coders working in tandem with CDI specialists and physicians can create a feedback loop that enhances documentation quality. Education is central—when providers understand how their wording translates into data, they become more intentional in their charting. Coders can help facilitate this by serving as translators between clinical practice and coding standards. In the future, this collaboration may be formalized into more hybrid roles, blending clinical, coding, and informatics skills.

Another universal challenge lies in the sheer volume and velocity of coding work. Global digitization is driving change and medical coders are expected to maintain high productivity while managing increasingly complex cases, volumes of information and coding updates. Burnout is real in this profession, especially when accuracy is scrutinized through audits while being held to high production expectations and quick turnaround times.

In this regard, automation and AI-assisted coding offer promising solutions—if implemented thoughtfully.

These tools can handle routine tasks, such as selecting codes for common, well-documented procedures, freeing up coders to focus on more nuanced and high-risk cases. However, organizations must resist the temptation to rely on AI without proper oversight. Coding software should serve as a decision-support tool, not a decision-maker. Coders will need training to critically evaluate AI suggestions, ensuring errors aren't blindly propagated.

Finally, data integrity and interoperability pose emerging challenges. As coding becomes increasingly embedded in broader data systems, inconsistencies between systems or across facilities can introduce errors and inefficiencies. Moving forward, the adoption of standardized coding interfaces, real-time validation tools, and interoperability frameworks will be essential. Coders will need to work closely with IT and informatics teams to ensure accurate mapping between coding systems and electronic health records (EHRs).

In essence, the path forward requires a blend of people, process, and technology. Coders must be empowered through education, supported by collaborative workflows, and equipped with tools that enhance—not replace—their judgment. In doing so, we can elevate the role of coding from a transactional task to a strategic function that underpins the quality, efficiency, and equity of healthcare delivery.

Looking ahead, I feel a mix of excitement and responsibility. The role of coders is expanding. We are becoming stewards of healthcare data in a digital age. There's a growing need for coders to understand health informatics, data analytics, privacy regulations, and even machine learning. The skills we develop now will determine our relevance and value in a rapidly evolving system. Ultimately, the future of clinical medical coding is not just about codes—it's about understanding people, systems, and the meaningful data that connects them. And that, I believe, is a future worth investing in.

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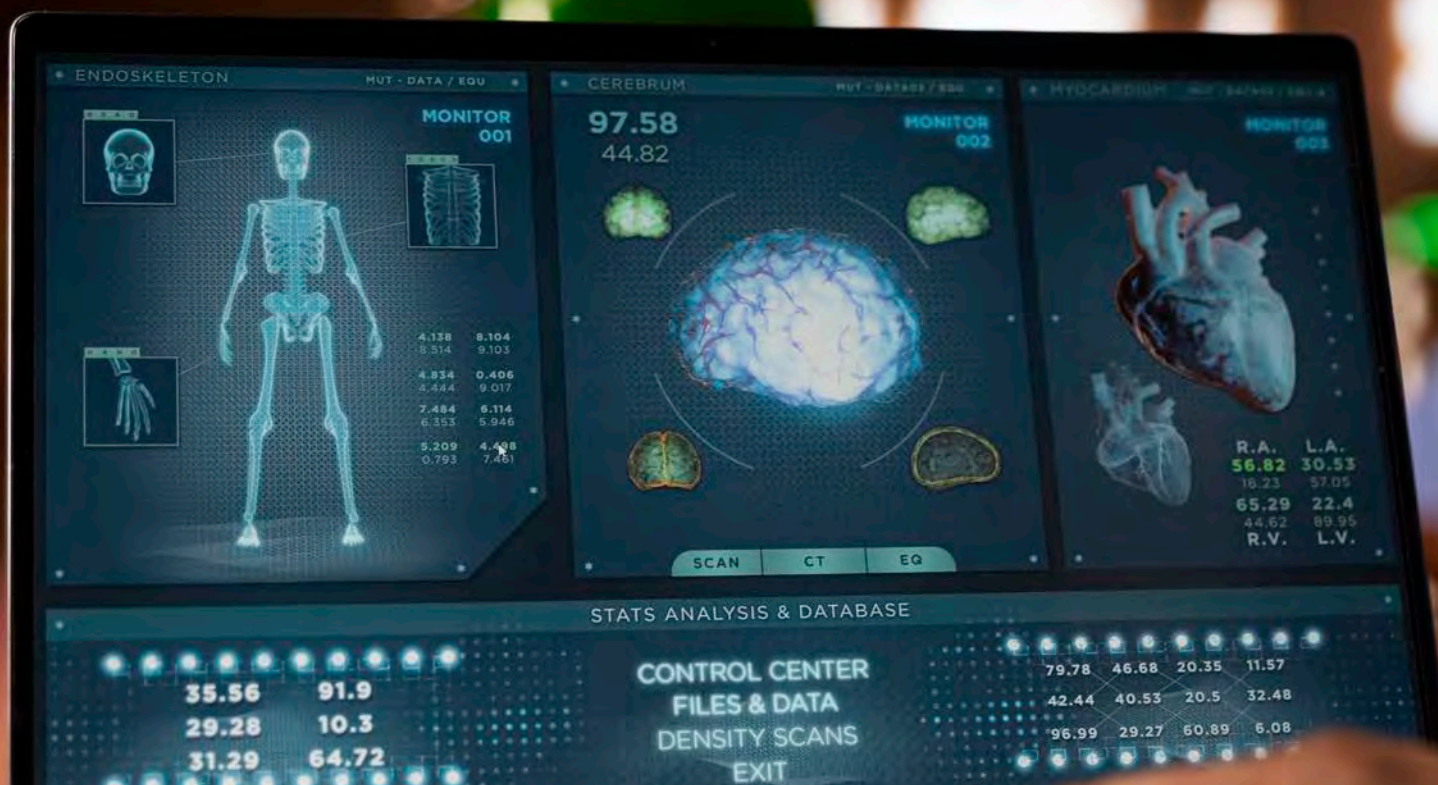
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Pharmacy	0022	To be claimed on the same script number as the Vaccine NAPPI code.
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The Current Clinical Coding Landscape in South Africa: Challenges and Opportunities

Karen van der Westhuizen

As South Africa's healthcare system continues to evolve, the role of clinical coding becomes increasingly pivotal. Accurate and standardised coding not only ensures fair reimbursement but also enhances data-driven decision-making, ultimately improving patient outcomes.

Different coding schemes are used to capture diagnostic and procedural data in the healthcare sector in South Africa. Despite the established frameworks, several challenges persist:

- **Infrequent updates to clinical codes and RVUs:** The Relative Value Unit (RVU) system, integral to determining reimbursement rates, lacks regular updates and reviews in South Africa. The same infrequent updates and reviews applies to the clinical codes. This can lead to discrepancies in data management and reimbursement.

- **Technological advancements outpacing coding systems:** Innovations like Transcatheter Aortic Valve Implantation/Transaortic Valve Replacement (TAVI/TAVR) has transformed patient care. However, coding systems often lag in accommodating these advancements.

- **Ethical dilemmas:** The old age debate between open surgery vs laparoscopic procedures must be noted as one of the many examples. Not necessarily the clinical debate, but the reimbursement associated with it. Tipping the scale between a higher income versus a better patient outcome, creates an ethical minefield.

- **Lack of a centralized coding authority:** The absence of a dedicated national body to oversee coding standards, updates, and training leads to inconsistencies and hampers the evolution of coding practices in line with global standards.

Listing challenges without mentioning possible solutions will be as outdated as some of the codes currently in use. Possible strategies for improvement that may bridge the gap are listed (but not limited to):

- **Establish an independent central coding authority:** Creating a dedicated, fully funded national panel of independent experts to oversee coding standards, updates, and training, can ensure consistency and adaptability to emerging medical practices. True

experts in their respective fields that can contribute exponentially to clinical and actuarial conundrums. Add a department to scrutinise the application of alternative reimbursement strategies and groupers to ensure the ethical and clinical correctness of the allocation and interpretation may change the way we look at data in the future.

- **Regular review and update of codes and RVUs:** Implementing a systematic review process for codes (annually) and RVUs (every five to ten years) will ensure that clinical codes and the reimbursement rates remain fair and reflective of current medical practices.

- **Integration of technology in coding:** Leveraging artificial intelligence and automation can enhance coding accuracy and efficiency, reducing administrative burdens and errors.

- **Standardization across public and private Sectors:** Adopting uniform coding systems and standards across all healthcare sectors will facilitate better data collection, analysis, and policymaking. Interoperability will enhance a seamless flow data and processes.

- **Documentation:** The phrase "If it has not been written down, it has not been done" is known to many. The value of an audit trail in decision making is immeasurable. Knowing when and why a change to a code, RVU or system was implemented, will assist with the upkeeping of the integrity of any decision and system.

The future of clinical coding in South Africa hinges on collaboration, innovation, and commitment to excellence. By addressing current challenges and embracing technological advancements, both the public and the private healthcare system can ensure interoperability, accurate documentation, fair reimbursement, and improved patient care.

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- Cerebrospinal fluid leaks
- Cochlear implant(s)
- Alcoholism
- Chronic liver disease
- Immunodeficiencies acquired at birth or later in life, such as HIV infection.
- Chronic renal failure or nephrotic syndrome
- Various types of Cancer such as Leukaemia, Lymphoma, multiple myeloma, Hodgkin's disease, or other generalised and metastatic malignancies
- Medication-induced immunosuppression because of treatments such as radiation therapy, chemotherapy, and long-term use of corticosteroids
- Solid organ transplant

Prescription from the GP is required to obtain pneumococcal vaccine at the pharmacy.

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Discipline	Administration codes	Notes
General Practitioner	0017	To be charged together with the Vaccine NAPPI codes if there was no consultation.
Pharmacy	0022	To be claimed on the same script number as the Vaccine NAPPI code.
Nurse Practitioner	99378	To be charged together with the Vaccine NAPPI codes if there was no consultation.

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The Impact of Emerging Technologies on Clinical Coding Practices

by Sibonelo Sibiya

In the rapidly evolving landscape of healthcare, the role of clinical coding is becoming increasingly crucial.

As we embrace the digital age, the integration of emerging technologies such as artificial intelligence (AI), machine learning, and automation into clinical coding practices is transforming the way we approach data management in healthcare. These advancements promise not only to enhance the accuracy and efficiency of coding but also to unlock new opportunities for improving patient care and operational efficiency.

One of the most significant impacts of AI on clinical coding is its ability to analyze vast amounts of data with unprecedented speed and accuracy. Traditional coding methods often rely on human coders to interpret clinical documentation and assign appropriate codes. This process is not only time-consuming but also prone to errors due to varying interpretations of medical terminology or insufficient documentation. AI-powered coding solutions can mitigate these challenges by utilizing natural language processing (NLP) algorithms that understand and interpret clinical language, thereby reducing the risk of misinterpretations and improving coding accuracy.

Moreover, automation in clinical coding can significantly streamline workflows. By automating repetitive tasks such as data entry and code assignment, healthcare organizations can free up valuable time for coders to focus on more complex cases that require human judgment and expertise. This shift not only enhances productivity but also allows coders to engage in continuous learning and professional development, ultimately leading to higher job satisfaction and retention rates.

The integration of emerging technologies in clinical coding also fosters better collaboration between coding professionals and healthcare providers. With real-time data analytics, coders can provide immediate feedback to clinicians regarding documentation practices, ensuring that clinical records are complete and accurate. This collaborative approach not only improves coding quality but also enhances patient care by enabling providers to make informed decisions based on reliable data.

However, the transition to technology-driven coding practices is not without its challenges. The implementation of AI and automation requires a significant investment in training and resources. Coders must be equipped with the skills to work alongside these technologies, embracing a mindset of continuous learning and adaptation. Additionally, concerns around data privacy and security must be addressed, as the use of AI often involves the processing of sensitive patient information.

To bridge the gap between traditional coding practices and the future of clinical coding, healthcare organizations must foster a culture of innovation and collaboration.

Sibonelo Sibiya

This includes investing in ongoing education and training for coding professionals, encouraging interdisciplinary teamwork, and prioritizing ethical considerations in the deployment of emerging technologies. By doing so, we can harness the full potential of AI and automation to improve coding practices and ultimately enhance patient outcomes.

In conclusion, the impact of emerging technologies on clinical coding is profound and multifaceted. As we navigate this transformative era, it is imperative that we embrace these advancements while remaining vigilant about the challenges they present. By leveraging the power of AI, machine learning, and automation, we can not only improve the efficiency and accuracy of clinical coding but also unlock new opportunities for innovation in healthcare delivery. As coding professionals, we have a unique opportunity to shape the future of our field, ensuring that we remain at the forefront of this exciting transformation.

The Future of Medical Coding: The benefits and challenges of AI in coding
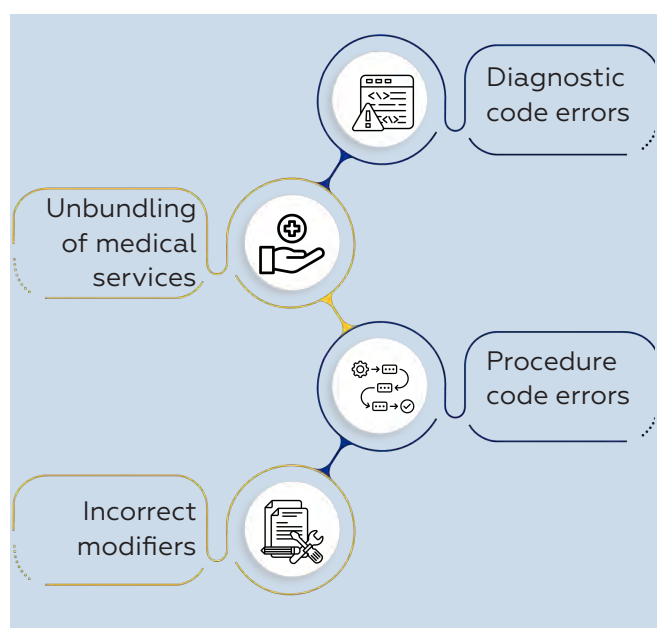
by Prof Morgan Chetty

"Medical coding is an essential process for accurate billing and patient record management. AI has emerged as potent tool to revolutionize medical coding."

Estimates from research in the US found that 80% of medical bills contains errors. These errors cost Americans $210 billion annually, with up to 75% of medical bills containing coding errors that account for 42% of medicare claim denials.

Examples of coding errors include:

- Diagnostic code errors
- Unbundling of medical services
- Procedure code errors
- Incorrect modifiers

Compounding this problem, approximately a quarter of US healthcare spending goes to administrative functions.

It is estimated that 600 000 nurses plan to leave healthcare by 2027 due to stress and burnout.

AI should be used to reduce physician burden and enable expert medical coders to focus on more complex tasks, allowing everyone to perform at their best and at the top of their licence, resulting in cost savings. AI will not replace humans, instead it is designed to improve their capabilities. With "Human-in-the-loop, AI augmented systems can achieve better results than AI or humans on their own".

In healthcare, AI can drive efficiency and improve performance with human oversight, with value-based coding being the goal.

Quoting from Oxford Global Resources [December 17, 2024];

"Sophisticated algorithms can analyse vast amounts of medical records, identifying and categorizing information with superior accuracy, reducing human error, streamlining workflows and enhancing the quality of patient care."

Embracing AI in medical coding is not without hurdles. There are benefits and challenges to integrating AI into medical coding.

By leveraging AI capabilities, healthcare providers can achieve a higher standard of care characterized by accuracy, speed and reliability.

An integral aspect of this technological revolution is implementing AI in medical coding. According to Becker Hospital Review, "one AI-powered solutions can achieve a 5 to 7 time productivity lift in both simple and complex coding tasks". This frees up significant time for healthcare professionals to focus on patient care.

Benefits of AI in Medical Coding

1. Enhanced Accuracy

Inaccurate coding can be related to provider documentation, which is often incomplete, missing, contradictory or incorrect with cloning the EHR notes. This has to improve with "Autonomous coding to be accurate".

Quoting from the Oxford Global Resources; "With its ability to process vast amounts of data and learn from patterns, AI can significantly reduce the likelihood of coding errors, but only when given the right input**.**

Machine learning algorithms can be trained on historical coding data to identify and correct inaccuracies, ensuring precise coding that aligns with industry standards.

2. Increased efficiency

AI driven coding systems can dramatically increase efficiency. Manual coding is time consuming and labor intensive. On the other hand, AI algorithms can swiftly analyze and categorize data, automating much of the coding process. The efficiency speeds up billing cycles and frees healthcare professionals to focus on patient care rather than administrative tasks.

Recent research published in JAMA Network Open reveals that Primary Care physicians (PCPs) spend more time on electronic health records (EHR) than any other speciality.

3. Cost savings

Implementing AI in medical **s** of healthcare can lead to substantial cost savings. Private payers could save $80 billion to $110 billion annually over the next 5 years, while physician groups could save 3% to 8% of their costs, equating to $ 20 billion to $ 60 billion.

4. Improved compliance

A critical aspect of medical coding is compliance to regulatory standards. AI plays a pivotal role in ensuring adherence to coding guidelines and regulations. Machine learning models can be updated regularly to reflect changes in coding standards and regulatory requirements.

5. Real-time Data Insights

AI-powered medical coding systems can provide real-time data insights invaluable for decision-making. AI can identify trends, patterns and anomalies by analysing coding data instantly. These insights can improve patient outcomes and optimize resource allocation.

Real-time data analysis can also support predictive analytics, enabling healthcare providers to proactively anticipate and address potential issues.

Challenges of AI in Medical Coding
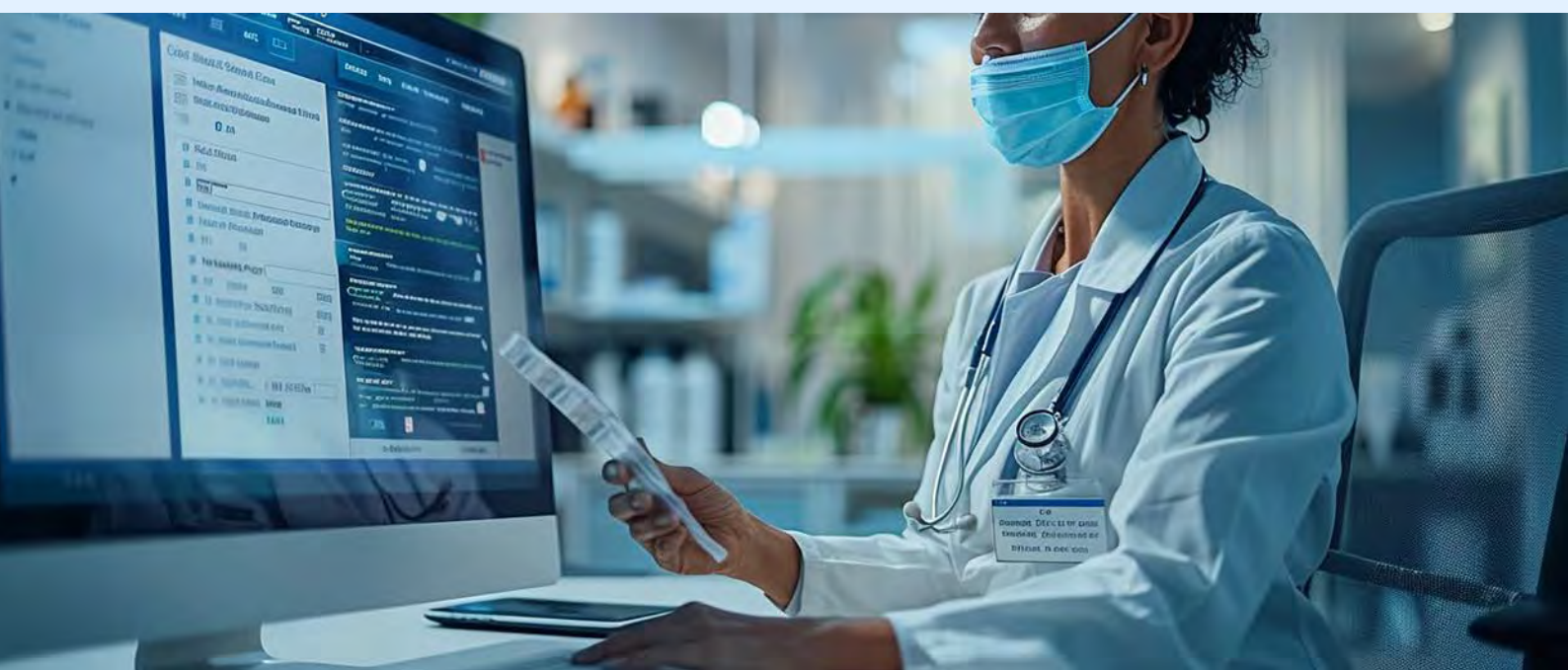
Data Privacy and Security

Integrating AI into medical coding raises concerns about data privacy and security. Healthcare data is highly sensitive and any breach can have severe consequences.

Integration with existing systems

Implementing AI in medical coding requires seamless integration with existing healthcare information systems. Many healthcare organizations use EHR systems, billing platforms and coding software. Integrating AI solutions with these unrelated systems can be challenging and may need investment into infrastructure and training. Ensuring interoperability is essential for successful adoption.
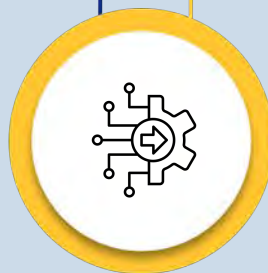
Initial cost and resource allocation

AI can lead to long-term savings, the initial investment required for AI implementation can be substantial.

Dependence on Data Quality

AI effectiveness in medical coding heavily depends on Quality of the data processes. Inaccurate and incomplete data can lead to erroneous coding and undermine the benefits of AI. Healthcare organizations must ensure that their data is accurate, standardized and up to date to maximize the potential of AI-driven coding system.

Ethical considerations

The use of AI in medical coding raises ethical considerations that must be addressed. AI algorithms can inadvertently introduce biases based on the data they are trained on, leading to disparities in coding practices.
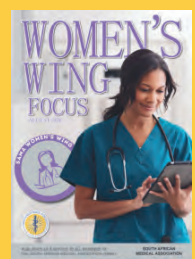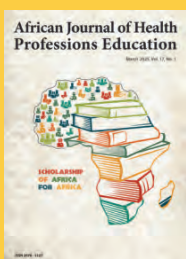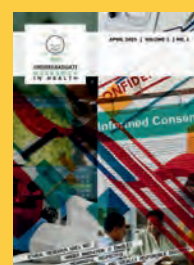
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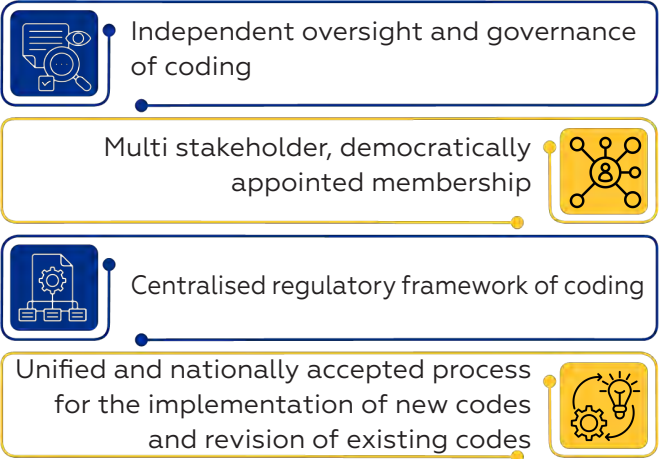
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The South African Classification of Healthcare Interventions (SACHI)

by Simon Strachan

The South African Private Practitioners Forum (SAPPF) registered SACHI as an NPC in 2008 and overthe last 18 months has been engaging far and wide to promote this organisation. To date we have had no dissenting voice other than a lukewarm reception from the Department of Health. We havehad commitment from SAMA, the Board of Healthcare Funders (BHF) and The Health Funders Association (HFA) to participate in the process to implement SACHI.

Streamlined resource analysis to ensure appropriate and acceptable funding before publication of a coding manual.

Coding is necessary to navigate the Healthcare environment.

A Procedural code in South Africa is a set of digits that is linked to it an explanation of a specific medical intervention. This is the descriptor of the code and the descriptor is specific to the scope of practice of a Healthcare Professional (HCP). This code and descriptor are then assigned a relative value unit which allows for an expression of the relative complexity of a specific procedure within adiscipline compared with other procedures.

HCPs are the ones who determine descriptors and then apply the RVU. This is not in the purvey of anyone else. It is HCPs who review codes as the scope of practice in their field changes with advances in medical care.

This process of code reviews or new code adoption is provided and facilitated by the South African Medical Association (SMA) and if the codes are accepted, they are published by SAMA in the Medical Doctors Coding Manual (MDCM). Over the years this has proven to be an effective and transparent process. The sad reality however is that over the last 17 years of annual publications of the MDCM, less than 20% of published new codes have been accepted by funders.

The foundation of SACHI is:

Independent oversight and governance of coding

Multi stakeholder, democratically appointed membership

Centralised regulatory framework of coding

Unified and nationally accepted process for the implementation of new codes and revision of existing codes

Some of the Challenges

The problem is that funders generally revert to the codes contained in the NRPL 2006. This position

is further supported by the CMS Circular 66 of 2021 where in the CMS states: "The Council for Medical Schemes (CMS) wishes to notify the industry that it recognises the National Reference Price List (NRPL) 2006 as the last legal procedure coding system for South Africa and uses it to adjudicate complaints and claim-related matters.

Taking note of the emergence of new codes for various clinical disciplines, the CMS requests that the industry ensure this coding system does not negatively affect members and beneficiaries of medical schemes." This stance by the CMS is unacceptable and we have been striving to have the CMS rescind or amend Circular 66. Because the funding industry is fragmented HCPs have to engage with multiple funders to motivat for their codes and to discuss alternative reimbursement models. There is no one central place where this happens.

Funders are demanding that any coding changes have a zero financial impact on the scheme. Each scheme will then do their own utilisation analysis and impact study and this process can take years.

New HCPs have to be educated in using the coding system. This requires discipline representative groups to provide regular and ongoing training platforms on coding.

There is no mechanism to accurately code for work done in multidisciplinary teams. While coding errors form a small percentage of cases of fraud waste abuse and error, the process of audits is frequently stressful and time consuming for HCPs who feel victimised by the process.

Ambiguity in some code descriptors leads to different interpretations by funders.

The Solution:

South African Classification of Healthcare Interventions (SACHI) A solution is to create a centralised, independent organisation to oversee the governance of coding.

This must allow HCPs to retain their autonomy in code and descriptor development. This means that the current work SAMA does on coding is retained. Stakeholders in this centralised structure will be all the funders and regulators along with HCPs.

Funders will have sight of any code changes while they are in development. This will allow for centralised data analytics, health technology assessments and engagement with HCPs. Each funder will eventually make their own decision about code acceptance for remuneration but this decision will be known before the code is published in the MDCM. This also provides an opportunity to develop alternative reimbursement models and a framework for objective outcomes measurement essential for value-based healthcare.

The potential benefits of this organisation:

a) Independent coding oversight

b) Effective and streamlined review of codes

c) All parties participate at initiation of a review

d) Ensure accuracy of descriptors

e) Ensure appropriate RVUs

f) Strategic funding reviews

g) Reduce duplication of the need for analytics.

h) Opportunities for ARMS and Value based Care

i) Data sharing and utilisation reviews

j) Facilitates development of OMR

k) Co-ordination at a National Level

We are in the process of developing a Memorandum of Understating that ensures that the governing Board is completely independent and trustworthy.

We expect this to be positively disruptive in the South African Healthcare space with benefits for all participants.

Dr. Simon Strachan

CEO SAPPF

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The Future of Clinical Coding in South Africa: AI-Powered Transformation for a Complex Tomorrow

by Anton van Schalkwyk

As South Africa approaches a transformative era in health information systems, clinical coding stands as both a challenge and an opportunity. The planned transition to ICD-11 and potential adoption of ICHI (International Classification for Health Interventions) procedures introduces not only greater clinical detail but also greater coding complexity.

Traditional manual methods of assigning codes, though effective in the ICD-10 era, are no longer fit for purpose in an age of big data, universal health coverage, and international reporting standards. Together with that, SAPPF and SAMA is planning to launch SACHI (South African Classification for Health

Interventions) to reform and expand Doctors' Coding and bring it to international standards.

To manage this complexity while improving coding completeness, accuracy, and efficiency, artificial intelligence (AI) and smart technology systems will be central. AI is uniquely positioned to not only support human coders but also automate, learn, adapt, and even innovate in the realm of health classification systems. As we move forward, AI will become not just a coding assistant—but a critical engine for code development, crosswalking, and audit-ready data integrity.

Beyond Crosswalks: The Limits of Traditional Mapping

Crosswalks—tools that link codes from one classification system to another—have long been used to ease transitions between coding systems. They are essential in helping healthcare systems maintain continuity of reporting, preserve billing integrity, and align epidemiological data across systems. South Africa's efforts to crosswalk from ICD-10 to ICD-11 will likely follow this same route.

However, crosswalks have natural limitations. ICD-10 is fundamentally pre-coordinated and relatively linear,

while ICD-11 introduces post-coordination, allowing for multiple axes of clinical meaning to be expressed in combination. This shift in structure means that a simple one-to-one mapping is often impossible. ICD-11 uses clustered codes, and the clinical granularity far exceeds ICD-10's capacity.

Moreover, ICD-11 is digitally native, designed for use in computer-assisted environments—meaning manual coding strategies are ill-equipped to handle the model. In this context, crosswalks are only one side of the coin. Without intelligent systems capable of understanding both clinical nuance and code logic, critical detail will be lost during translation, leading to incomplete or inaccurate data.

AI offers a way to go beyond the rigidity of traditional crosswalks. It can manage many-to-many mappings, interpret post-coordinated clusters, and propose intelligent substitutions based on local context. Rather than relying solely on static mapping tables, AI can dynamically adapt, simulating clinical reasoning to support coders in making the right coding choices across classification systems.

AI in Pre-coordinated Code Development Post-Coordinated coding in ICD-11 and ICHI

One of the most powerful—and underexplored—roles of AI is its ability to assist in the development of new coding structures. In countries like South Africa, where national adaptations of international classifications are necessary for reimbursement, public health reporting, and service planning, precoordinated codes offer a practical solution. However, building them manually is time-intensive and requires multidisciplinary input.

AI can expedite this process dramatically. By training on existing clinical records, AI can:

- Identify common code combinations that recur in South African clinical practice.

- Cluster related conditions and interventions to propose clinically valid precoordinated terms and codes. ICD-11 and ICHI are time consuming an unnecessarily complex to use, but it can be used to create new pre-coordinated codes and

modifiers for easier, quicker and more comprehensive identification of interventions in pre-coordinated codes.

- Detect local variations in clinical documentation and suggest code adaptations accordingly.

- Assist policymakers and classification bodies in designing a custom national extension of ICD-11 or ICHI that remains compatible with WHO standards.

Furthermore, AI can be used to automatically validate new precoordinated codes against existing datasets, checking for duplications, contradictions, or overlaps with current codes. This ensures the new codes are not only clinically meaningful but also logically structured and interoperable.

In essence, AI transforms the role of coding authorities from code creators to code curators, where the bulk of pattern recognition, clustering, and logical structuring is done by machines, allowing human experts to focus on governance, clinical accuracy, and policy alignment.

Streamlining and Accelerating Crosswalk Development

Building crosswalks is often a painstaking manual task, involving months of comparison between classification systems, line-by-line coding validation, and expert consensus. In a fast-evolving health environment, such delays are costly.

AI can radically speed up this process by:

- Analysing dual-coded datasets to learn probabilistic relationships between ICD-10 and ICD-11 codes.

- Using natural language processing (NLP) to link free-text descriptions in both systems and suggest optimal matches.

- Applying machine learning algorithms to flag mismatches, ambiguous cases, and code gaps.

- Creating dynamic crosswalks that evolve over time as new coding practices are adopted or local adaptations emerge.

By simulating thousands of real-world coding scenarios, AI can also predict where semantic drift may occur and recommend code corrections or enhancements. This can be particularly helpful in high-volume environments such as hospitals, medical schemes, and central coding authorities.

Ultimately, AI enables a live crosswalk environment—where codes can be mapped and verified in real-time, with up-to-date alignment across datasets and coding versions. This is critical for institutions seeking to transition seamlessly without data loss or misreporting.

Smart Systems That Ask—Not Just Answer

In the South African coding environment, incomplete clinical documentation is a frequent challenge. Coders often encounter operative notes without diagnoses, discharge summaries lacking key descriptors, or patient histories with missing context. Traditional systems are limited to responding to coder input—they do not have the intelligence to detect what's missing or initiate clarification.

This is where the future lies: AI-powered smart coding agents that ask questions when the data is incomplete or unclear.

Examples include:

- Prompting the coder: "No site specified for this fracture—should it be coded to the left or right?"

- Asking the clinician: "The diagnosis mentions 'renal failure'—can you confirm if it is acute or chronic?"

- Suggesting: "You have coded cholecystectomy—was this laparoscopic or open?"

By building logic into the AI system, it can simulate a clinical reasoning pathway, helping complete the code set and improving case mix accuracy. These systems could be embedded directly into EHRs or coding platforms, ensuring questions are asked in the clinical workflow rather than after data submission.

Importantly, the AI can learn from previous clarifications, adapting its questions to each facility, specialty, or even coder style. This makes it not just responsive, but intelligently proactive.

Building the Infrastructure in South Africa

To implement such a sophisticated AI-assisted coding system, South Africa must invest in technical infrastructure, governance frameworks, and human capacity development. Key components include:

a.   Digital Integration

AI must be integrated with hospital information systems (HIS), electronic medical records (EMRs), pathology and theatre management systems to pull data contextually.

b.   Data Localisation and Customisation

AI models must be trained on South African datasets, incorporating local clinical expressions, public-sector diagnostic patterns, and private billing nuances.

c.   Governance and Oversight

Regulatory bodies like the National Department of Health, the Council for Medical Schemes, and coding related bodies such as PHISC (Private Healthcare Information Standards Committee) must develop policy to ensure standardised outcomes.

d.   Human-AI Collaboration Models

Coders should not be replaced but empowered. Training programmes must focus on AI supervision, validation, and exception management, repositioning coders as clinical data supervisors.

e.   Pilot Programmes and Phased Implementation

AI deployment should begin with targeted pilot sites (e.g. large regional hospitals, academic institutions) and expand in stages, with robust auditing to ensure data integrity and clinical safety.

AI as the Bridge to ICD-11 and ICHI

AI is more than a convenience—it is the only scalable solution to the challenges posed by ICD-11 and ICHI adoption.

Key contributions include:

- Semantic alignment between ICD-10 legacy data and ICD-11's cluster-based structure, Semantic alignment between Pre-Coordinated and Post-Coordinated interventional Codes and will inevitably change coding from the current fee-for-service model to a Value Based Care Model to ensure a more efficient outcome based funding model.

- Automated reclassification of old data for epidemiological consistency.

- Contextual understanding of ICHI interventions based on action-target-means logic.

- Enabling partial automation of coding while flagging ambiguities for human validation.

- Maintaining up-to-date crosswalks and mappings as coding standards evolve.

In short, AI systems can serve as live translators, validators, and coders, enabling organisations to adopt modern classifications without waiting for documentation systems or training to catch up.

Conclusion: From Coders to Clinical Data Architects

South Africa stands at a unique inflection point. With one foot in ICD-10, CPT and MDCM or RPL, and the other reaching toward ICD-11and probably ICHI and SACHI, the country must adopt not just new codes—but an entirely new mindset. AI offers the tools to meet this challenge head-on.

By enabling smart systems that complete, question, learn, code, map, and innovate, AI transforms the coder's role into that of a clinical data architect—one who supervises intelligent systems, ensures quality, and curates meaningful health data.

On the development side of coding, Coders, with actuarial backup, will develop codes and its values, combining the inputs of relevant societies or associations, medical schemes and the National Department of Health concerning universal healthcare, where applicable. On the users' side coders will have to be the gatekeepers of accuracy, being the architect of each complex code set that is being billed or evaluated for payment.

In this vision, coders, clinicians, and policymakers work together to reshape South Africa's health data landscape—building a coding future that is not just technically sound, but intelligent, locally relevant, and globally aligned.

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