

**Course: Health Records Management**  
**Lecture: 7 Health Data Quality and Accuracy**  
**Lecturer: Dr. Johnson Masinde**

## **7.1 Introduction**

**Health Data Quality and Accuracy** are critical components in **Health Records Management**, as they determine the reliability, validity, and usability of health information for clinical, administrative, research, and policy-making purposes. **High-quality and accurate health data** ensures effective patient care, supports health system planning, **enables performance monitoring, and fosters evidence-based decision-making**. Inaccurate or incomplete health data can lead to **medical errors, poor clinical outcomes**, resource misallocation, and compromised health statistics. Therefore, maintaining **data integrity**, ensuring **consistency**, and enforcing **quality control mechanisms** are essential in managing health information systems.

Health data quality is assessed through dimensions such as **completeness, accuracy, timeliness, consistency, and validity**. Ensuring accuracy involves verifying that recorded data truly represents real-world health conditions or patient events. In the modern healthcare environment, where **electronic health records (EHRs)** and **health information systems (HIS)** are widely used, maintaining data quality requires adherence to established standards, periodic data audits, and capacity building for health record officers and data clerks.

This topic covers four main subtopics:

1. Concept and Dimensions of Health Data Quality
2. Factors Affecting Health Data Accuracy
3. Methods and Tools for Ensuring Health Data Quality
4. Quality Assurance and Improvement Strategies in Health Data Management

### **Expected Learning Outcomes**

By the end of this topic, learners should be able to:

1. **Explain the concept and importance of health data quality and accuracy** in the management of health records.
2. **Identify and describe the key dimensions of data quality** applicable to health information systems.
3. **Analyze the major factors influencing data accuracy** in health records management.
4. **Apply appropriate methods and tools** to monitor, evaluate, and enhance the quality of health data.
5. **Recommend strategies for maintaining and improving health data quality and integrity** within healthcare organizations.

### **Subtopic 1. Concept and Dimensions of Health Data Quality**

**Health data quality** refers to the degree to which health data is **accurate, complete, reliable, relevant, and timely enough to serve its intended purpose**. In health records management, quality data supports clinical decision-making, reporting, and planning.

#### **Key dimensions of health data quality include:**

- **Accuracy:** Data correctly represents the real-world event or patient condition without errors.
- **Completeness:** All required data elements are recorded and available for use.
- **Timeliness:** Data is recorded and made available within the required timeframe for decision-making.
- **Consistency:** Data remains uniform and coherent across different systems and reports.
- **Validity:** Data conforms to defined formats, codes, and standards (e.g., ICD-10, SNOMED).
- **Integrity:** Data remains intact and unaltered during storage and transmission.
- **Accessibility:** Data is easily retrievable by authorized users for clinical or administrative use.

These dimensions form the foundation for assessing and maintaining high-quality health records.

### **Subtopic 2. Factors Affecting Health Data Accuracy**

Several factors influence the accuracy of health data in both manual and electronic systems:

- **Human Errors:** Mistakes during data entry, transcription, or coding due to fatigue, lack of training, or negligence.
- **Poor Documentation Practices:** Incomplete or unclear clinical notes and medical forms.
- **Inadequate Training:** Health record staff lacking skills in medical terminology, classification, and coding standards.
- **System Design Flaws:** Poorly designed electronic systems that allow invalid or inconsistent entries.
- **Lack of Standardization:** Absence of uniform data collection tools, procedures, and definitions.
- **Data Duplication and Redundancy:** Occurs when the same data is entered multiple times in different systems.
- **Limited Supervision and Quality Audits:** Without routine checks, errors and inconsistencies accumulate over time.

Addressing these factors requires proper policies, continuous staff training, and quality monitoring mechanisms.

### **Subtopic 3. Methods and Tools for Ensuring Health Data Quality**

To ensure high data quality and accuracy, health information managers employ several **methods and tools**, such as:

- **Data Validation Rules:** Built-in checks in electronic systems to prevent invalid entries (e.g., range limits, mandatory fields).
- **Routine Data Quality Assessments (RDQA):** Periodic evaluation of data accuracy, completeness, and timeliness.
- **Data Cleaning:** Reviewing and correcting inconsistencies, duplicates, and missing information.
- **Health Information Standards:** Adoption of standardized terminologies, codes, and formats (e.g., HL7, ICD, LOINC).

- **Use of Dashboards and Data Analytics Tools:** For monitoring data quality indicators and visualizing performance trends.
- **Audit Trails:** Tracking changes in electronic systems to identify errors or unauthorized alterations.
- **Training and Capacity Building:** Continuous professional development for data clerks, health record officers, and clinicians on data management and reporting standards.

These methods ensure that data used for clinical care and decision-making is credible and reliable.

#### **Subtopic 4. Quality Assurance and Improvement Strategies in Health Data Management**

Maintaining and improving health data quality requires a structured **Quality Assurance (QA)** and **Continuous Quality Improvement (CQI)** approach.

**Key strategies include:**

- **Establishing Data Quality Policies and Guidelines:** Ensures uniform data handling procedures across facilities.
- **Implementing Data Quality Audits (DQAs):** Regular assessment and verification of data against source documents.
- **Feedback and Review Mechanisms:** Providing data users with regular feedback on data performance indicators.
- **Supervision and Mentorship:** On-the-job coaching to reinforce correct documentation and reporting practices.
- **Use of Quality Improvement (QI) Teams:** Multidisciplinary teams that identify data issues and develop corrective actions.
- **Leveraging Technology:** Utilizing automated data validation tools and interoperability standards to enhance accuracy.
- **Performance Monitoring:** Establishing benchmarks and tracking improvements over time through quality indicators.

An effective data quality management framework ensures that health data supports accurate reporting, informed decision-making, and optimal patient care outcomes.

In summary, **health data quality and accuracy** are fundamental to efficient and effective health records management. They underpin reliable health information systems that support clinical excellence, resource allocation, and evidence-based health policies. Strengthening health data quality requires **a culture of accuracy, accountability, and continuous improvement**, supported by robust systems, trained personnel, and adherence to international standards.

## 7.2 Concept of Health Data Quality

**Health data quality** refers to the **degree to which health data is accurate, complete, reliable, and suitable for its intended use** in clinical care, management, research, and policy formulation. It determines how effectively data can support patient care, monitor disease trends, and guide decision-making within the health system.

In **health records management**, high-quality data ensures that healthcare professionals can **make informed clinical decisions**, managers can **plan and allocate resources effectively**, and policymakers can **formulate sound health policies**. Poor data quality, on the other hand, may lead to **misdiagnosis, treatment errors, financial loss, and compromised public health outcomes**.

Health data is generated from multiple sources such as **patient records, laboratory results, pharmacy systems, and national health surveys** and its quality depends on how accurately it is captured, stored, and maintained. Therefore, maintaining high data quality is a shared responsibility among health professionals, records officers, and data managers

### Importance of Health Data Quality

- **Supports clinical decision-making:** Enables accurate diagnosis and appropriate treatment.
- **Enhances healthcare planning:** Facilitates effective allocation of resources and service delivery improvement.
- **Enables monitoring and evaluation:** Helps assess the performance of health programs and interventions.
- **Improves accountability:** Reliable data supports transparency in reporting and auditing.
- **Supports research and policy development:** Ensures evidence-based decision-making in the health sector.

## Dimensions of Health Data Quality

Health data quality is evaluated based on several **dimensions** or **attributes**, each representing a specific aspect of data integrity and usefulness.

### 1. Accuracy

Accuracy refers to the **degree to which data correctly represents the real-world facts, events, or patient conditions**. Accurate data is free from errors or distortions and reflects what actually occurred. For example, a patient's recorded diagnosis should match the true medical condition as determined by the clinician.

#### Indicators of accuracy:

- Correct data entry and coding
- Verification against source documents
- Minimal typographical or transcription errors

### 2. Completeness

Completeness means that **all required data elements are recorded without omission**. Incomplete data (e.g., missing patient age, diagnosis, or treatment details) can compromise the usefulness of the record and lead to misinterpretation.

#### Indicators of completeness:

- All mandatory fields are filled
- No missing values or blank sections in records
- Comprehensive patient documentation

### 3. Consistency

Consistency ensures that **data remains uniform and coherent across different sources and systems**.

When the same data item (such as patient gender or ID) appears in multiple databases or reports, it should be identical.

**Indicators of consistency:**

- No conflicting information across systems
- Harmonized data entry procedures
- Alignment between manual and electronic records

**4. Timeliness**

Timeliness refers to **the extent to which data is recorded, updated, and made available within** the required time frame. Delayed data entry or reporting can affect patient care and delay management decisions.

**Indicators of timeliness:**

- Data entry within the expected reporting period
- Real-time or near-real-time updates in EHRs
- Prompt submission of health facility reports

**5. Validity**

Validity refers to **the conformity of data to defined formats, standards, and accepted rules**. Valid data follows coding standards such as **ICD-10, SNOMED, or LOINC**, ensuring uniformity and comparability across systems.

**Indicators of validity:**

- Correct use of medical codes and classifications
- Adherence to national or international data collection standards
- Use of approved data dictionaries and forms

## 6. Reliability

Reliability refers to the **stability and dependability of data over time**. Data should produce the same results if collected or measured repeatedly under the same conditions.

### Indicators of reliability:

- Standardized data collection procedures
- Minimal variation in repeated measurements
- Well-documented data sources

## 7. Integrity

Integrity ensures that **data remains intact, secure, and unaltered during storage, transfer, or use**. It involves protecting data from unauthorized modification, deletion, or corruption.

### Indicators of integrity:

- Secure data storage and access controls
- Use of audit trails in electronic systems
- Backup and disaster recovery mechanisms

## 8. Accessibility

Accessibility means that **data is readily available and easily retrievable by authorized users** for clinical, administrative, or research purposes. Data that is not easily accessible may be underutilized, reducing its value to the organization.

### Indicators of accessibility:

- Authorized user access without undue delay
- Availability of user-friendly retrieval systems
- Proper data indexing and metadata management

The **concept and dimensions of health data quality** form the backbone of effective **health records management**. Ensuring data accuracy, completeness, timeliness, and consistency enhances the credibility of health information systems and improves patient care and decision-making. Health institutions must therefore adopt **quality assurance frameworks, data validation tools, and capacity-building programs** to sustain high standards of health data quality.

### 7.3 Factors Affecting Health Data Accuracy

**Health data accuracy** is the extent to which recorded health information correctly represents actual facts, events, or patient conditions. It ensures that data used for clinical care, research, planning, and decision-making is **reliable, valid, and trustworthy**. Inaccurate data leads to **medical errors, misdiagnosis, poor health planning, and unreliable statistics**. Accuracy in health records depends on several interacting factors **human, technological, organizational, procedural, and environmental** which determine how well information is captured, processed, and maintained. Understanding these factors helps in identifying data weaknesses and implementing quality improvement strategies.

#### 1. Human Factors

Human errors are a major cause of data inaccuracy in healthcare environments. Mistakes often occur during data entry, documentation, or coding. Key issues include **data entry errors, poor handwriting, inadequate training, and work overload**. Health record staff and clinicians may misinterpret information or fail to verify entries due to fatigue or time pressure. A lack of supervision or feedback also contributes to recurring errors.

**Example:** Incorrect transcription of patient diagnosis or medication details can lead to serious clinical and reporting errors.

**Control measures:** Continuous staff training, supportive supervision, clear documentation procedures, and periodic verification of entries.

#### 2. Technological Factors

The increasing use of **Electronic Health Records (EHRs)** and **Health Information Systems (HIS)** introduces both opportunities and risks for data accuracy.

**System design flaws, lack of data validation features, interoperability challenges, and system crashes** can result in inaccurate or lost data. Inadequate automation of checks allows invalid data entry, while poorly designed interfaces confuse users and lead to incorrect selection of fields.

**Example:** An EHR system that lacks validation rules may allow unrealistic entries such as a negative patient age.

**Control measures:** Use of data validation tools, regular system maintenance, adoption of standardized software, and user-friendly interfaces.

### **3. Organizational and Administrative Factors**

Health data accuracy is also influenced by **organizational culture, policies, and resource allocation**. Weak data governance structures, absence of standardized reporting formats, and poor quality assurance practices undermine accuracy. Inadequate funding for training and ICT tools, coupled with poor interdepartmental communication, can lead to inconsistent or incomplete reporting.

**Example:** If a hospital lacks standardized coding procedures, clinicians may record diagnoses differently, affecting the reliability of health statistics.

**Control measures:** Develop data quality policies, establish quality assurance programs, conduct regular data audits, and promote accountability through clear data governance structures.

### **4. Procedural and Systemic Factors**

Procedural weaknesses often arise from **inefficient workflows and lack of documentation protocols**. When roles and responsibilities in data entry or review are unclear, errors and inconsistencies increase. Multiple data entry points or double handling of records may result in duplication or loss of information. Additionally, poor application of coding systems such as **ICD-10** or **SNOMED** can cause data misclassification.

**Example:** When multiple staff enter patient data without coordination, conflicting information may appear in different systems.

**Control measures:** Streamline workflows, clarify roles, enforce documentation standards, and apply proper coding and classification systems

## **5. Environmental and External Factors**

External and workplace conditions can also affect data accuracy. **Overcrowded workspaces, poor lighting, noise, and time pressure** reduce concentration during documentation. Cultural and language barriers between healthcare providers and patients can lead to misinterpretation of patient details. Additionally, frequent changes in **policy or reporting indicators** without proper orientation create confusion in data entry.

**Example:** A sudden change in health reporting tools without adequate training may cause staff to enter information incorrectly.

**Control measures:** Improve working environments, ensure adequate staffing, provide translations or standard terminologies, and communicate policy updates effectively.

## **6. Data Collection and Source Issues**

Accuracy is closely tied to the **quality and reliability of data sources**. If information is gathered from incomplete or secondary sources, errors easily occur. Inconsistent data collection tools or poorly designed registers can omit important details. Duplicate patient records also distort accuracy and lead to inflated service statistics.

**Example:** Using informal notes to extract patient data instead of official medical records increases the chance of incorrect entries.

**Control measures:** Use standardized forms, validate data sources, avoid duplication through unique identifiers, and regularly reconcile data.

## **7. Lack of Data Quality Culture**

An institutional culture that does not value data quality results in persistent inaccuracies. When staff are not sensitized to the importance of accurate data, they may treat documentation as a secondary duty. The absence of feedback or recognition discourages improvement.

**Example:** Staff may fail to verify data entries if they receive no feedback or incentives for maintaining accuracy.

**Control measures:** Build a culture of data ownership, provide regular feedback, establish recognition programs, and emphasize the role of data in improving patient outcomes.

Health data accuracy is influenced by a combination of **human behavior, technology, management systems, procedures, and environmental conditions**. Inaccurate data compromises patient safety, misguides policy decisions, and weakens health system performance. Achieving accuracy requires a **comprehensive approach** training health personnel, standardizing data procedures, improving technological systems, and promoting a culture that values data integrity. Regular audits, feedback mechanisms, and use of data validation tools further enhance accuracy, ensuring that health information remains a dependable foundation for effective healthcare delivery and management.

## **7.4 Methods and Tools for Ensuring Health Data Quality**

**Health data quality** is the foundation of reliable health information systems and effective decision-making in healthcare. Ensuring that health data is **accurate, complete, consistent, timely, and valid** requires the use of structured **methods and tools** that help identify, measure, and correct data errors. These methods enable health professionals and record managers to **monitor data performance, detect inconsistencies, and implement corrective actions** that sustain high data quality standards.

As healthcare systems increasingly depend on **electronic health records (EHRs)** and **health information systems (HIS)**, it becomes essential to adopt robust data quality assurance mechanisms. These mechanisms combine **manual and automated tools** to ensure that the information captured truly represents patient conditions, supports service delivery, and meets reporting and policy needs.

### **1. Data Validation and Verification Methods**

**Data validation** and **verification** are key methods for checking the accuracy and integrity of health data at the point of entry or during data review.

- **Data Validation Rules:** Built-in validation checks in EHRs and HIS restrict invalid entries (e.g., preventing negative ages or unrealistic laboratory values).
- **Cross-Verification:** Comparing data across multiple sources (e.g., patient files vs. facility registers) to ensure consistency.
- **Double Data Entry:** Entering data twice independently and comparing the two sets to identify discrepancies.
- **Automated Error Alerts:** Systems can generate alerts when unusual or missing data are detected, prompting immediate correction.

**Example:** In an immunization program, data validation rules can prevent recording of vaccine doses beyond the standard age limit, ensuring accurate reporting.

## 2. Routine Data Quality Assessments (RDQA)

**RDQA** is a structured approach used to measure the quality of health data and assess adherence to data management procedures. It provides an ongoing mechanism for identifying weaknesses in data collection and reporting.

### Key elements of RDQA include:

- Reviewing data consistency between source documents, registers, and reports.
- Checking completeness and timeliness of submitted data.
- Assessing staff capacity and adherence to standard operating procedures.
- Generating action plans to address identified gaps.

**Benefits:** RDQA improves accountability, enhances confidence in data, and promotes evidence-based health management decisions.

**Example:** District health teams in Kenya use RDQA tools quarterly to evaluate the accuracy of facility-level data submitted to DHIS2.

## 3. Data Cleaning and Data Auditing

**Data cleaning** refers to the systematic process of identifying and correcting inaccurate, incomplete, or duplicate records in datasets. It ensures that health data is free from errors before analysis or reporting.

**Data auditing**, on the other hand, involves comprehensive review and verification of data to ensure adherence to standards and policies.

**Common techniques:**

- Identifying and removing duplicate records.
- Standardizing data formats and codes.
- Correcting inconsistencies between datasets.
- Tracing missing values and updating them from source documents.

**Example:** Regular cleaning of patient databases helps remove duplicate patient IDs and ensures each record accurately represents an individual.

#### **4. Use of Standardized Health Information Standards and Coding Systems**

Standardization ensures that health data is collected, classified, and stored in a uniform manner across institutions. Adopting recognized coding and classification systems enhances comparability and reliability of data.

**Common standards include:**

- **ICD-10 (International Classification of Diseases):** For diagnosis and mortality classification.
- **SNOMED CT:** For standardized clinical terminology.
- **LOINC:** For laboratory and clinical observation data.
- **HL7 (Health Level Seven):** For electronic data exchange and interoperability.

**Benefits:** Promotes consistency, supports integration between systems, and improves data interpretation.

**Example:** Using ICD-10 codes ensures that a diagnosis of “Diabetes Mellitus” is consistently recorded and comparable across facilities.

## 5. Data Quality Monitoring and Reporting Tools

Regular monitoring helps track data performance and identify anomalies early. Health organizations use a variety of tools and dashboards for this purpose.

### Examples of monitoring tools:

- **Data Quality Dashboards:** Visualize data accuracy, completeness, and timeliness indicators.
- **Scorecards and Performance Reports:** Display facility-level data performance and trends over time.
- **Audit Trails:** Track user activities in electronic systems, showing who entered or modified data and when.
- **Data Quality Indicators:** Quantitative measures such as percentage of complete records or error rates in reporting.

**Benefits:** Promotes transparency, supports timely corrective action, and enables comparison between departments or facilities.

**Example:** A hospital dashboard showing monthly reporting completeness helps managers identify underperforming departments.

## 6. Capacity Building and Training

Human capacity is central to maintaining data quality. Well-trained staff understand the importance of accurate data and the procedures for capturing it correctly.

### Capacity-building initiatives include:

- Continuous training on data collection, coding, and reporting standards.
- Mentorship programs for new health records staff.

- Workshops on electronic system usage and troubleshooting.
- Refresher courses on national health data policies and tools.

**Example:** Training data clerks on the use of DHIS2 reporting tools ensures uniform understanding and consistent data entry across health facilities.

## 7. Supervision, Feedback, and Data Review Meetings

Regular **supportive supervision** and **data review meetings** reinforce accountability and continuous improvement. Supervisors verify data accuracy, provide feedback, and mentor staff on best practices.

### Components include:

- On-site data verification visits.
- Feedback on data quality reports and identified gaps.
- Monthly or quarterly review meetings to discuss data performance.
- Development of action plans for improvement.

**Example:** Facility health information officers reviewing monthly immunization data with nurses to correct discrepancies and improve future reporting.

## 8. Data Quality Frameworks and Quality Assurance Systems

Many health organizations adopt **Data Quality Assurance (DQA) frameworks** to institutionalize quality practices. These frameworks outline systematic steps for monitoring, evaluation, and improvement.

### Key examples:

- **WHO Data Quality Review (DQR) Framework** – provides a standardized approach for assessing data accuracy, consistency, and timeliness.
- **MEASURE Evaluation DQA Tool** – supports assessment of routine health information systems.

- **National Health Data Quality Guidelines** – country-specific standards guiding health data collection and reporting.

**Benefits:** Enhances consistency across programs, fosters institutional accountability, and supports continuous improvement cycles.

Ensuring **health data quality** requires a combination of **technical methods, management systems, and capacity-building interventions**. Tools such as validation checks, RDQA, data audits, and quality dashboards help detect and correct inaccuracies, while adherence to standardized coding systems ensures consistency and comparability. Regular supervision, feedback, and training strengthen the data quality culture within organizations. Ultimately, by applying these methods and tools, health institutions can guarantee that data used for clinical care, monitoring, and policy formulation is **accurate, reliable, and actionable**—the cornerstone of effective health records management.

## **7.5 Quality Assurance and Improvement Strategies in Health Data Management**

**Quality assurance (QA)** and **quality improvement (QI)** in health data management are systematic approaches aimed at ensuring that health data is **accurate, complete, consistent, timely, and reliable** for decision-making, clinical care, and reporting. QA focuses on **maintaining established standards**, while QI emphasizes **continuous enhancement of data processes** to achieve better performance. Together, they form the backbone of effective health information systems that support evidence-based healthcare and policy formulation.

### **Quality Assurance Strategies**

Quality assurance involves **planned, systematic activities** that ensure data meets predefined quality criteria. Key strategies include:

- **Development of Data Quality Policies and Standards:** Establishing institutional guidelines to standardize data collection, storage, and reporting.
- **Routine Data Quality Audits (DQA):** Regular checks comparing reported data with source documents to identify errors and inconsistencies.

- **Supervision and Monitoring:** Conducting regular field visits to verify data, mentor staff, and ensure adherence to data management procedures.
- **Data Validation Rules:** Embedding automated checks in electronic health systems to prevent invalid entries.
- **Documentation and Record Review:** Ensuring that all patient records are properly completed, signed, and stored according to policy.

These strategies ensure that data produced is verifiable, accurate, and compliant with national and institutional standards.

## Quality Improvement Strategies

Quality improvement focuses on **correcting identified weaknesses** and **sustaining long-term data quality enhancement**. It is a proactive and continuous process involving:

- **Capacity Building:** Training and mentoring staff on data management, coding standards, and reporting tools.
- **Feedback and Performance Review Meetings:** Providing timely feedback on data quality results and developing action plans for improvement.
- **Use of Quality Improvement (QI) Teams:** Multidisciplinary teams that identify root causes of data errors and propose corrective actions.
- **Benchmarking and Performance Indicators:** Setting measurable standards and monitoring progress over time.
- **Technology Integration:** Using digital dashboards, audit trails, and analytics tools to monitor data quality indicators in real-time.
- **Supportive Supervision:** Regular mentorship and coaching to strengthen data ownership and accountability.

Quality assurance and improvement in health data management ensure that health information remains **accurate, reliable, and useful** for clinical, administrative, and policy functions. Establishing strong QA systems, continuous capacity building, and regular monitoring create a **data quality culture** that promotes transparency, accountability, and evidence-based decision-

making. Ultimately, effective QA and QI strategies transform raw data into **trusted health intelligence**, enhancing the overall performance of the health system.

## Self-Assessment Questions

1. Explain the key dimensions of health data quality and their significance in health records management.
2. Discuss the major factors that affect the accuracy of health data in healthcare institutions.
3. Describe the methods and tools commonly used to ensure the quality of health data in electronic health record systems.
4. Analyze the role of quality assurance and improvement strategies in promoting reliable and valid health information.
5. Evaluate how health data accuracy impacts decision-making and service delivery in healthcare settings.

## References

1. World Health Organization (WHO). (2017). *Data Quality Review: A Toolkit for Facility Data Quality Assessment*. Geneva: WHO Press.
2. Health Metrics Network. (2008). *Framework and Standards for Country Health Information Systems*. Geneva: World Health Organization.
3. AbouZahr, C., Boerma, T., & Hogan, D. (2019). *Data quality and accuracy in health information systems: A review of key concepts and methods*. *Bulletin of the World Health Organization*, 97(2), 101–109.
4. Centers for Disease Control and Prevention (CDC). (2020). *Data Quality Assurance Guidelines*. Atlanta, GA: CDC.
5. Raban, M. Z., & Westbrook, J. I. (2019). *Are interventions to improve the accuracy of medical record data effective? A systematic review*. *Journal of the American Medical Informatics Association*, 26(5), 568–579.

