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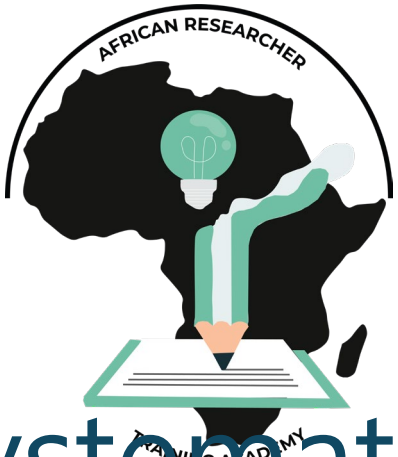

Conducting Systematic and Evidence Reviews

Presenters: Dr. Mary Mangai (UP), Dr. Mbuzeleni Hlongwa (HSRC) and Dr. Austin Ayodele (UP)

Date: 31 July 2025. Time: 14:00 – 16:00

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Session Learning objectives

At the end of this module, you should:

Understand the purpose and value of systematic and evidence reviews in research

- Distinguish between different types of reviews (e.g., systematic, scoping, narrative, evidence).
- Follow the key steps in planning and conducting a systematic/evidence review.
- Use tools like the **PRISMA flowchart** for reporting.
- Identify appropriate databases and develop search strategies.

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Session Outline

One and Two

- **One: Introduction & Objectives:** Quick overview of the session
- **Two: Overview of Review Types:** Systematic vs. scoping vs. narrative vs. evidence reviews

Three and Four

- **Three: Planning a Systematic/Evidence Review:** Formulating a clear research question
- **Four: Search Strategy & Database Use :** Identifying appropriate databases (PubMed, Scopus, Google Scholar, etc.) Using Boolean operators and keywords

Five, Six and Seven

- **Five: Screening & Data Extraction:** Title/abstract and full-text screening, Tools: Covidence, Rayyan, Excel
- **Six: Synthesising and Reporting:** Descriptive vs. meta-analysis synthesis (briefly), Reporting guidelines: **PRISMA**
- **Seven: Common Pitfalls & Ethical Considerations:** Selection bias, incomplete search strategies, managing grey literature

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What is Evidence Synthesis?

Definition:

- A process of systematically **collecting**, **evaluating** and **combining information from multiple studies** to answer a specific question
  - Systematic and evidence reviews are crucial for high-quality research
  - They help consolidate, appraise, and synthesise findings from existing studies (Moher et al., 2009; Gough et al., 2017).
  - Involves predefined methods to **identify**, **assess**, and **summarise** research findings for stronger conclusions
  - Unlike traditional literature reviews, they use **rigorous methods** to reduce bias and improve reliability

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Number of systematic reviews published each year

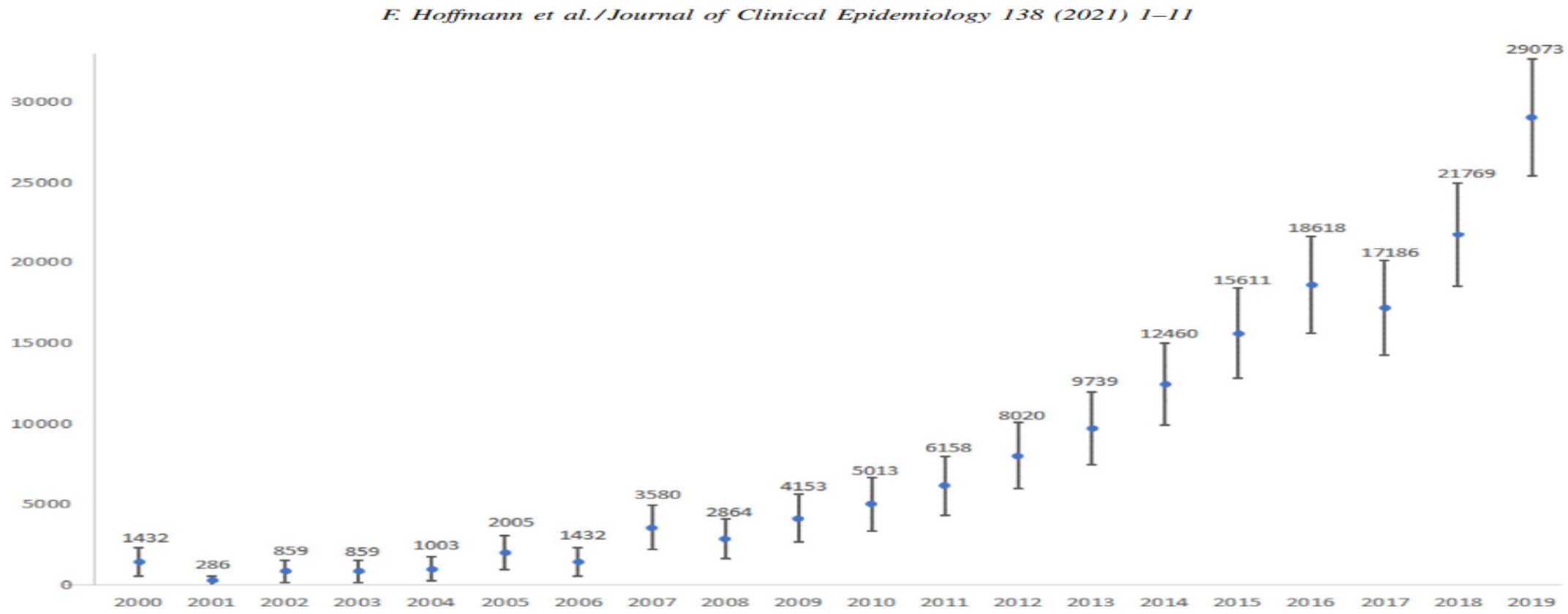

Fig. 2. Estimated number of SRs indexed in MEDLINE (via PubMed) per year (including 95% CI), 2000–2019

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Overview of review types

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Overview of Review Types

Review Type	Purpose	Characteristics	When to Use
Narrative Review (literature review)	To provide a thematic summary and interpretation of existing literature	Often selective, not necessarily systematic, used for theoretical discussions.	For background/contextual information in essays, dissertations, or theoretical papers.
Scoping Review	To map existing literature on a broad topic or emerging area	Broad in scope, includes various study types, does not assess quality in detail.	When exploring what is known, identifying gaps, or informing future research questions.
Rapid Review	Mainly focus on new or emerging research topics (e.g. COVID-19)	Fewer database sources are searched (e.g. PubMed). May include only **one reviewer** in each stage.	Used when **time** is limited
Systematic Review (meta-analysis, meta-synthesis)	To answer a specific, focused research question	Comprehensive search, critical appraisal, transparent and replicable methods. May include meta-analysis.	When a rigorous evidence synthesis is needed to **guide policy, clinical practice, or research.**
Umbrella Review (review of systematic review)	Summarizes findings from multiple systematic reviews to provide a high-level overview of evidence on a topic	High-level synthesis. Evaluates consistency and strength of findings across reviews.	When a high-level summary is needed to compare findings from systematic reviews and inform broad decision-making.
Living Systematic Review	Continuously updated systematic review as new evidence becomes	Ideal for fast-evolving fields (e.g., COVID-19)	When new evidence is emerging rapidly and may change conclusions (e.g., COVID-19)

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Differences between scoping & systematic review

Feature	Scoping Review	Systematic Review
Purpose	Broadly explores a topic	Answers a specific research question
Question type	Open-ended	Focused, specific
Search Strategy	Comprehensive	Comprehensive
Study Selection	Includes all relevant literature	Strict inclusion/exclusion criteria
Quality Appraisal	Optional	Mandatory
Data Synthesis	Descriptive/narrative	Quantitative (meta-analysis) or qualitative (meta-synthesis)
Outcome	Identifies gaps, themes, trends	Provides evidence-based conclusions

NB:

- Use a **scoping review** when you need to **map the literature, identify gaps, and clarify concepts**.
- **Use a systematic review** when you want to **synthesize high-quality evidence to answer a focused question**.

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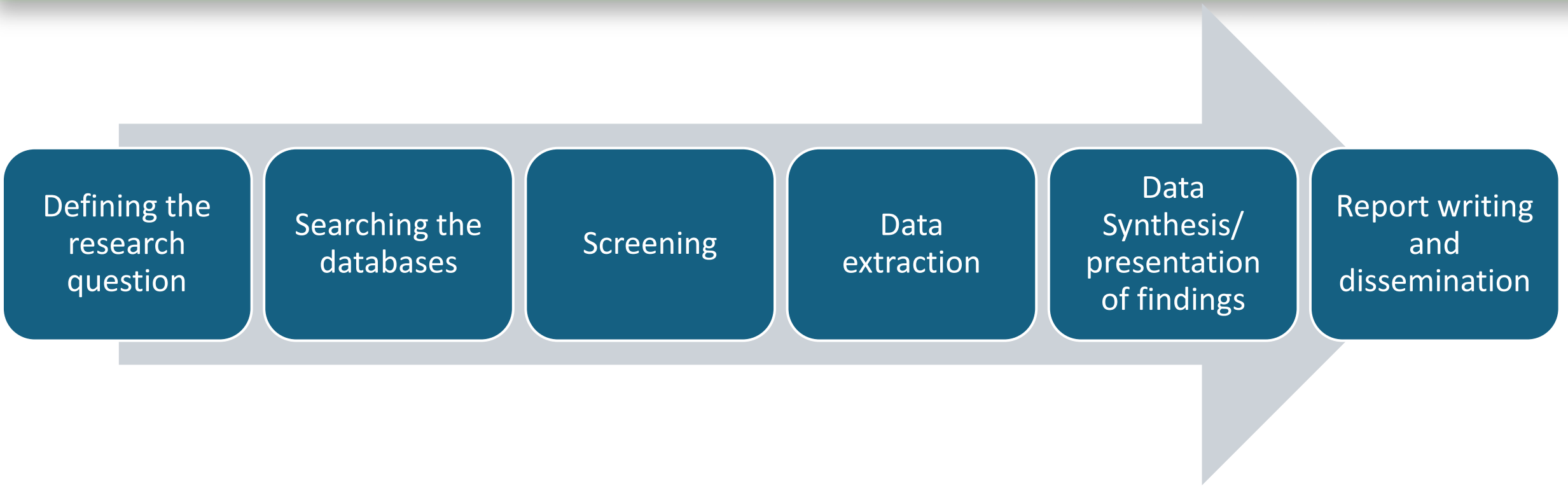
Stages of the Review



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Conceptualising the right research question for a review

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Why is the research question important?

- A well-defined question **guides the entire review process** (search strategy, study selection, data extraction).
- It ensures the review **addresses a meaningful gap** in the literature
- It helps in **identifying key concepts and structuring the scope** of the study.

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Differences between scoping & systematic review questions (i)

Feature	Scoping Review	Systematic Review
Purpose	Broad exploration of literature	Specific and focused
Question type	Open-ended	Precise and narrow
Example	***What is known*** *about barriers to HIV PrEP uptake among men in sub-Saharan Africa?*	*What is the* ***effectiveness*** *of PrEP interventions in preventing HIV among men in sub-Saharan Africa?*

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Differences between scoping & systematic review questions (ii)

Examples:

- **Scoping Review:**
  - *What is known about digital interventions for HIV self-testing in Africa?*
  - *What factors influence PrEP adherence among adolescent boys and young men?*

- **Systematic Review:**
  - *Does mobile health messaging improve PrEP adherence?*
  - *What is the effectiveness of HIV self-testing in increasing ART initiation?*

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Frameworks for developing a review question (i)

- The PICO framework is the most commonly used model for structuring questions because it captures each key element required for a focused question

	Focus	Questions to ask
P	**Population**, Patient or Problem	*How would I describe a group of patients similar to mine?*
I	**Intervention**, Exposure	*Which main intervention, or exposure am I considering?*
C	**Comparison** or Intervention (if appropriate)	*What is the main alternative to compare with the intervention?*
O	**Outcome** you would like to measure or achieve	*What can I hope to accomplish, measure, improve, or affect?*
s	**Study** design	*What study designs will help answer the research question?*

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Frameworks for developing a review question (ii)

- To ensure **clarity and comprehensiveness**, frameworks help structure the research question.
- **PCC (Population, Concept, Context)** is the recommended approach for scoping reviews.
  - **Population** – Who or what is the focus? (e.g., adolescents, healthcare workers, men at high risk of HIV).
  - **Concept** – What is being studied? (e.g., interventions, experiences, barriers, facilitators).
  - **Context** – Where or in what setting? (e.g., South Africa, low-resource settings, healthcare facilities).
- **Example:**
  "What are the barriers and facilitators to PrEP uptake (Concept) among adolescent boys and young men (Population) in sub-Saharan Africa (Context)?"

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Other frameworks (i)

- **SPIDER** (for Qualitative & Mixed-Methods Research)
  - **Sample** - Who is involved?
  - **Phenomenon of Interest** - What is being explored?
  - **Design** - Type of study (e.g., interviews, focus groups).
  - **Evaluation** - Outcomes or themes explored
  - **Research type** - Qualitative or mixed methods.

- **PEO** (For Qualitative Reviews)
  - **Population** - Who is the target group?
  - **Exposure** - What experiences or interventions are being studied?
  - **Outcome** - What is being measured?

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Other frameworks (ii)

- **SPICE** (for health and social research questions)
  - **Setting** - Where?
  - **Perspective** - For whom? (Population or stakeholders)
  - **Intervention** - What? (Service, policy, or practice)
  - **Comparison** - Compared to what?
  - **Evaluation** - What result or outcome is being measured?

- **ECLIPSE** (for health policy/service evaluation)
  - **Expectation** - What do you want to learn or improve?
  - **Client group** - Who is the service for?
  - **Location** - Where is the service located?
  - **Impact** - What change or outcome is expected?
  - **Professionals** - Who is involved in delivering the service?
  - **Service** - What is the service or intervention?

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Planning a Systematic/Evidence Review: Registering a Protocol

A protocol is a detailed, pre-specified plan that outlines the methodology, criteria, and procedures to be followed when conducting a systematic review, ensuring transparency and reproducibility. Its essential components include the following:

Best Practice: Register protocols early in the research process, ideally before beginning data collection or systematic searching

PROSPERO Registration

- International database for systematic review protocols
- Register before data extraction begins
- Provides a unique registration number
- Prevents duplication and reduces bias
- Free registration process
- Updates allowed with version tracking

Institutional Processes

- Internal review by research committees
- Ethics approval if human subjects are involved
- Institutional protocol repositories
- Supervisory review and approval
- Compliance with institutional guidelines
- Integration with research governance

Key Benefits & Requirements

- **Enhances research transparency** and accountability
- Supports reproducibility and quality assurance
- Required by many journals and funding bodies
- Facilitates collaboration and **prevents duplication**
- Creates a permanent record of research intentions

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Planning a Systematic/Evidence Review: Inclusion/Exclusion Criteria

Defining inclusion and exclusion criteria is vital for **a transparent and credible review**. However, **biases** can arise—language bias excludes non-English studies, publication bias omits grey literature, and temporal or methodological biases can skew findings (Cooper, 2017). To **mitigate these, involve diverse stakeholders in decision-making**, justify criteria with a clear rationale, and include varied evidence types. Balancing inclusivity with feasibility ensures comprehensive yet manageable synthesis, which enhances the validity and equity of systematic reviews across disciplines and knowledge systems.

Key Bias Sources

- **Language bias**: English-only restrictions.
- **Publication bias:** Grey literature exclusion.
- **Temporal bias**: Date restrictions.
- **Methodological hierarchies**: Privileging certain traditions.

Best Practices

- Engage diverse stakeholders.
- Document and justify all decisions.
- Consider multiple evidence types.
- Balance inclusivity with feasibility.

Search strategy and database use in Scopus – Hands on practical

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Search Strategy and Database Use - 1

Multiple databases are essential for comprehensive coverage, acknowledging inherent biases and coverage gaps (Bramer et al., 2017). The databases are categorised based on their focus:

Biomedical

PubMed/MEDLINE, Embase, CINAHL.

Multidisciplinary

Scopus, Web of Science, Google Scholar.

Specialized

Specific subjects or Discipline. Eg. PycINFO, ERIC, IEEE Explore, CINAHL

Regional

Global South and non-English sources. Eg AJOL, ECOWAS database, ADB, Eurostat, Australian Bureau of Statistics

Search Strategy and Database Use - 2

Advanced search strategies enhance precision in literature retrieval. Mastering Boolean logic is essential for effective database querying. This process improves relevance and reduces retrieval bias

Tips for Refining Search

- Apply **Parentheses (), quotation marks** for exact phrases ("mental health")
- Use **truncation symbols** (e.g., *child*) to capture word variants (child, children, childhood)
- Filter by **date range**, **study type**, or **language** to increase relevance
- Explore **controlled vocabularies** like MeSH (PubMed) or Emtree (Embase)
- **Test and revise** your search string based on initial results
- **Search multiple databases** to compare coverage and minimize bias

Use Boolean Logic

- **AND:** Combines terms, requiring results to contain all specified terms
- **OR:** Expands the search further by including results containing either term
- **NOT:** Excludes results containing a specific term
- **Parentheses ()** used to group terms and control the order of operations
- **Quotation marks** "“: Used to search for an exact phrase
- **Asterisk *** wildcard used to bring variations in words

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Screening and Data Extraction in Covidence – Hands-on practical

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Screening & Data Extraction

Screening Process

- **Title/Abstract Screening:** Quickly assess relevance based on inclusion/exclusion criteria
- Exclude clearly irrelevant studies at this stage
- **Full-Text Screening:** Detailed eligibility review
- Justify inclusion or exclusion with a clear rationale
- Independent dual screening
- Conflict resolution protocol
- PRISMA flow diagram documentation

Screening Tools

- **Covidence:** Web-based systematic review platform
- **Rayyan:** AI-assisted screening tool
- **Excel:** Simple manual tracking option. It is a flexible, accessible option
- Developing a Data Extraction Form
- Automated duplicate detection
- Progress tracking and reporting
- Define key variables (e.g., author, year, methods, outcomes)
- Pilot test for consistency and clarity across reviewers

Data Extraction Form

- Study characteristics (design, setting, population)
- Intervention/exposure details
- Outcome measures and results
- Risk of bias assessment fields
- Pilot testing before full extraction

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Screening and Extraction tool: Steps in Covidence

Step 1: Setting up Convidence https://www.covidence.org/

Step 2: Screening title, abstract and full text in convidence

Step 3: Full text retrieval in Convidence

Step 4:Extracting data and Quality Assessment

Step 5: Exporting Data in convidence

Step 6: PRISMA Reporting in Convidence

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Synthesizing and reporting

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Synthesising and Reporting - 1

Types of Synthesis

- ***Descriptive synthesis***: Summarizes findings narratively; suitable for diverse study designs and qualitative data
- ***Meta-analysis*:** Statistical pooling of data from comparable studies; quantifies overall effect size

Reporting Guidelines

- Use **PRISMA** (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure transparency and reproducibility

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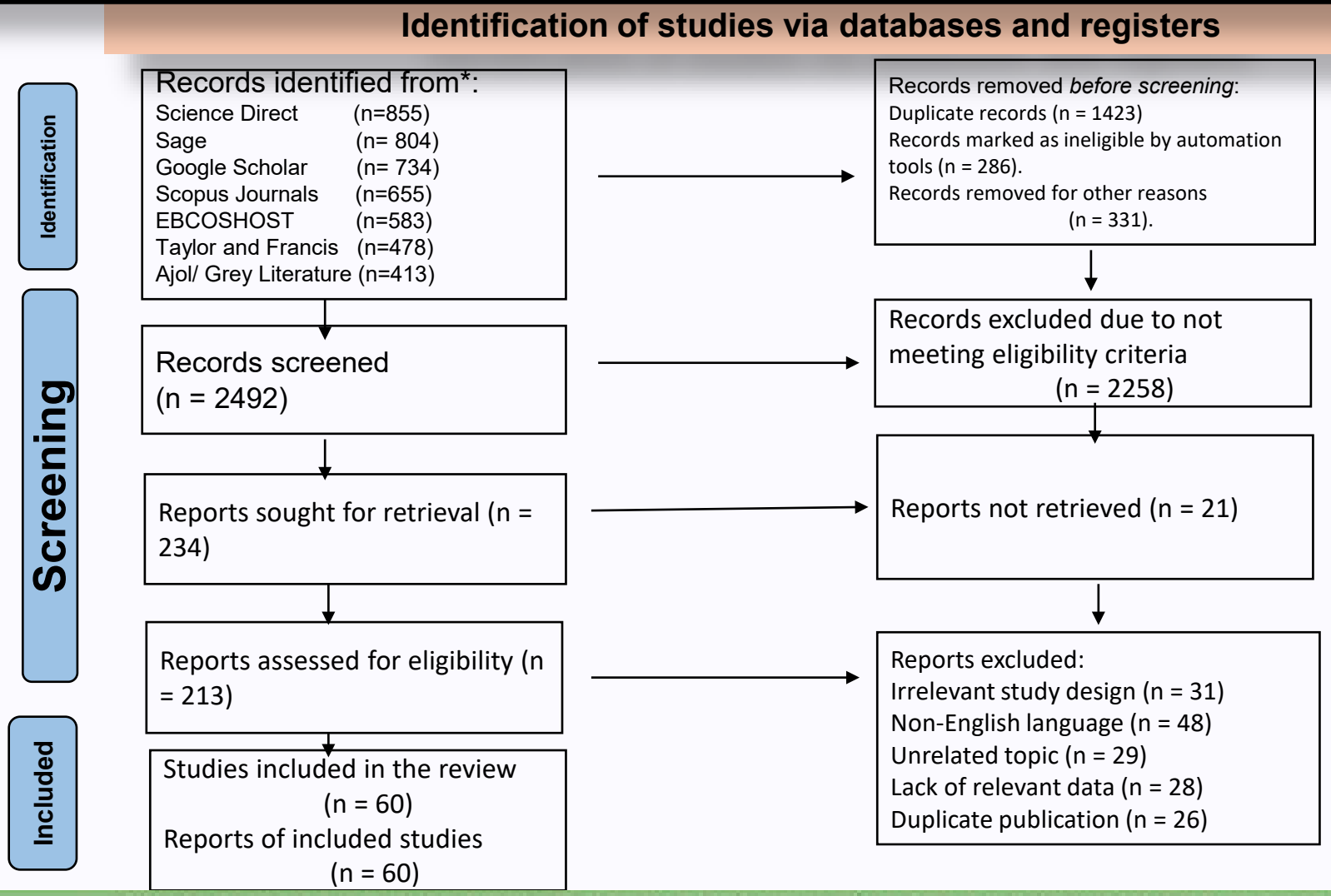
Synthesising and Reporting – 2: PRISMA 2020 FLOWCHART *(Page et al, 2021)*



Synthesising and Reporting – 2: PRISMA 2020 FLOWCHART *(Page et al, 2021)*

Table 1: Inclusion and Exclusion Criteria

Description	Inclusion	Exclusion
Focus of study	Studies addressing human security approaches in South Africa's provinces.	Studies unrelated to human security or governance frameworks, policing approaches in South Africa.
Research content	Research examining "policing the known" or "governing the unknown" in traditional and emergent security threats.	Studies focusing solely on unrelated governance issues or regions outside South Africa.
Type of study	Quantitative, qualitative or mixed-method studies. Conceptual and theoretical reviews are also considered.	Articles lack empirical or practical insights or lack sufficient conceptual and theoretical analysis.
Time frame	Studies published between 2000 and 2024.	Studies published before 2000 or lacking relevance to contemporary human security challenges.
Language	Articles published in English.	Articles in languages other than English.
Relevance to human security contexts	Empirical or applied research focusing on law enforcement, governance, inequality, or resilience strategies in South Africa.	Studies without direct relevance to human security challenges or governance in South Africa.

Synthesising and Reporting - 3: Example of Descriptive Table

Author & Year	Country	Study Aim	Sample / Population	Number of Participants	Age Group	Research Method	Key Findings
Qualitative studies							
Mukwaguzi et al. 2021	Uganda	To explore employed professional men's perspectives for uptake of HIV self-testing, and linkage to HIV care or prevention services	Males	33	18-55 years	Qualitative (interviews)	Incentives could improve linkage to HIV care after a reactive HIVST result.
Rujumba et al. 2021	Uganda	To explore the participation of pregnant/lactating women, male partners, and healthcare providers regarding male and repeat HIV self-testing during pregnancy/lactation, and suggest integration into PMTCT programs.	22 females, 31 males, 23 healthcare providers	76 total	24-40 years	Qualitative (interviews & focus groups)	Lack of active linkage to care systems, alongside stigma and confidentiality concerns, may delay timely linkage.
Makovu et al. 2020	Uganda	To generate data for designing a peer-led HIV self-testing intervention to improve testing uptake.	16 females, 31 males	47 total	15+ years	Qualitative (focus group discussions)	Men preferred home visits from healthcare providers as follow-up to encourage linkage to care after reactive HIVST results.
Conserve et al. 2018	Tanzania	To explore linkage to HIV care in Kisesa community, Rural Tanzania.	Males				

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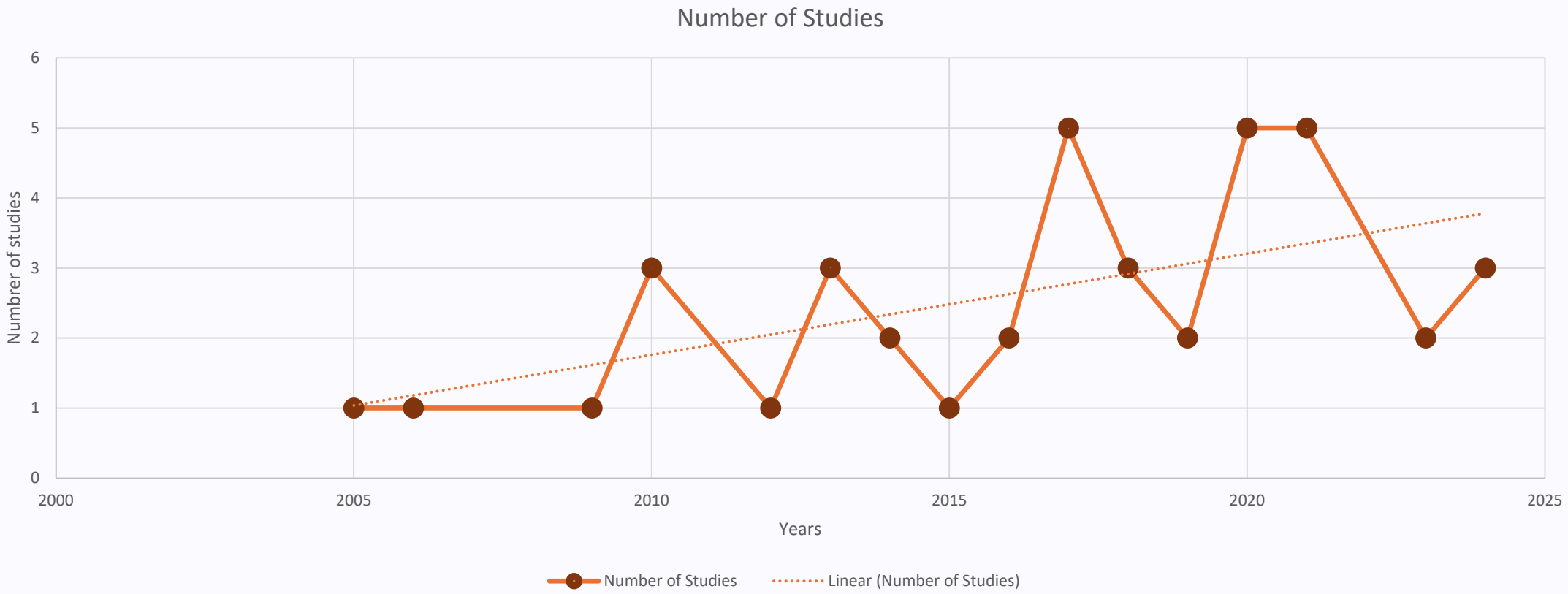

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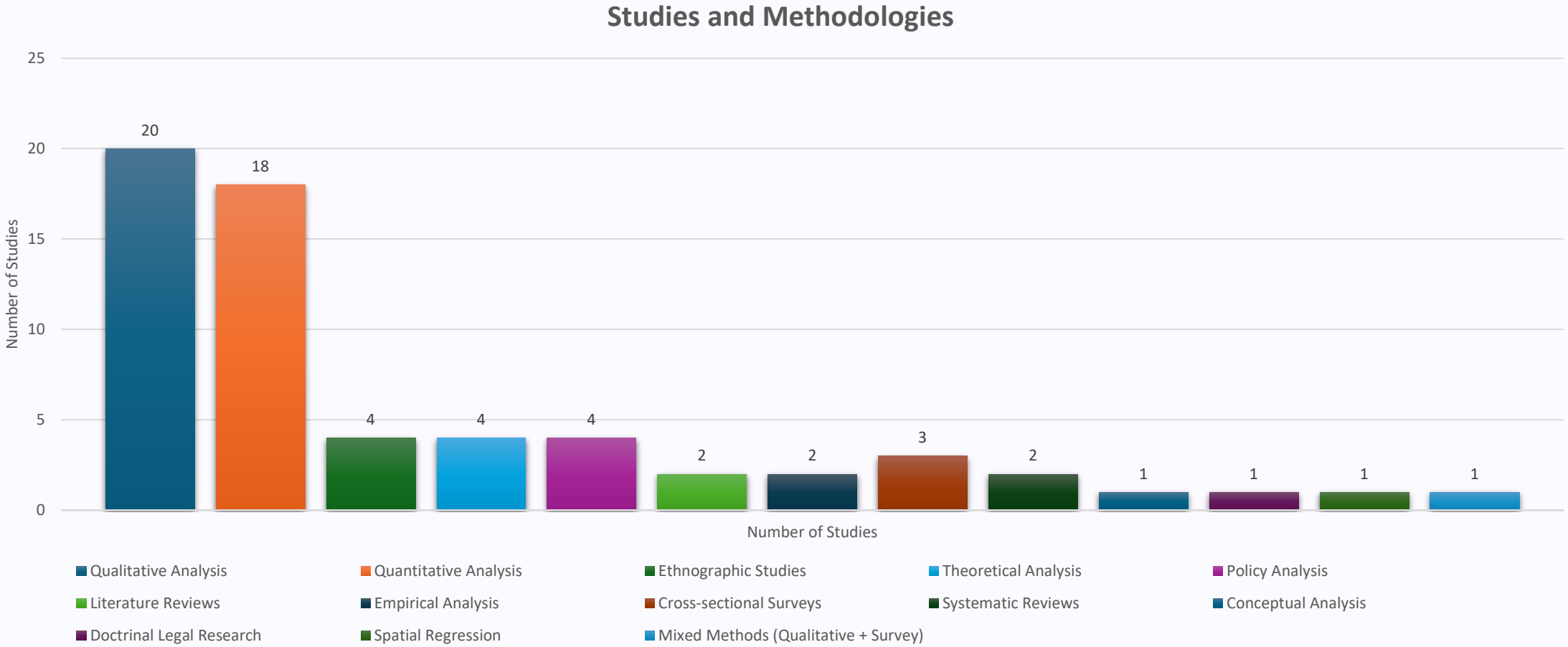

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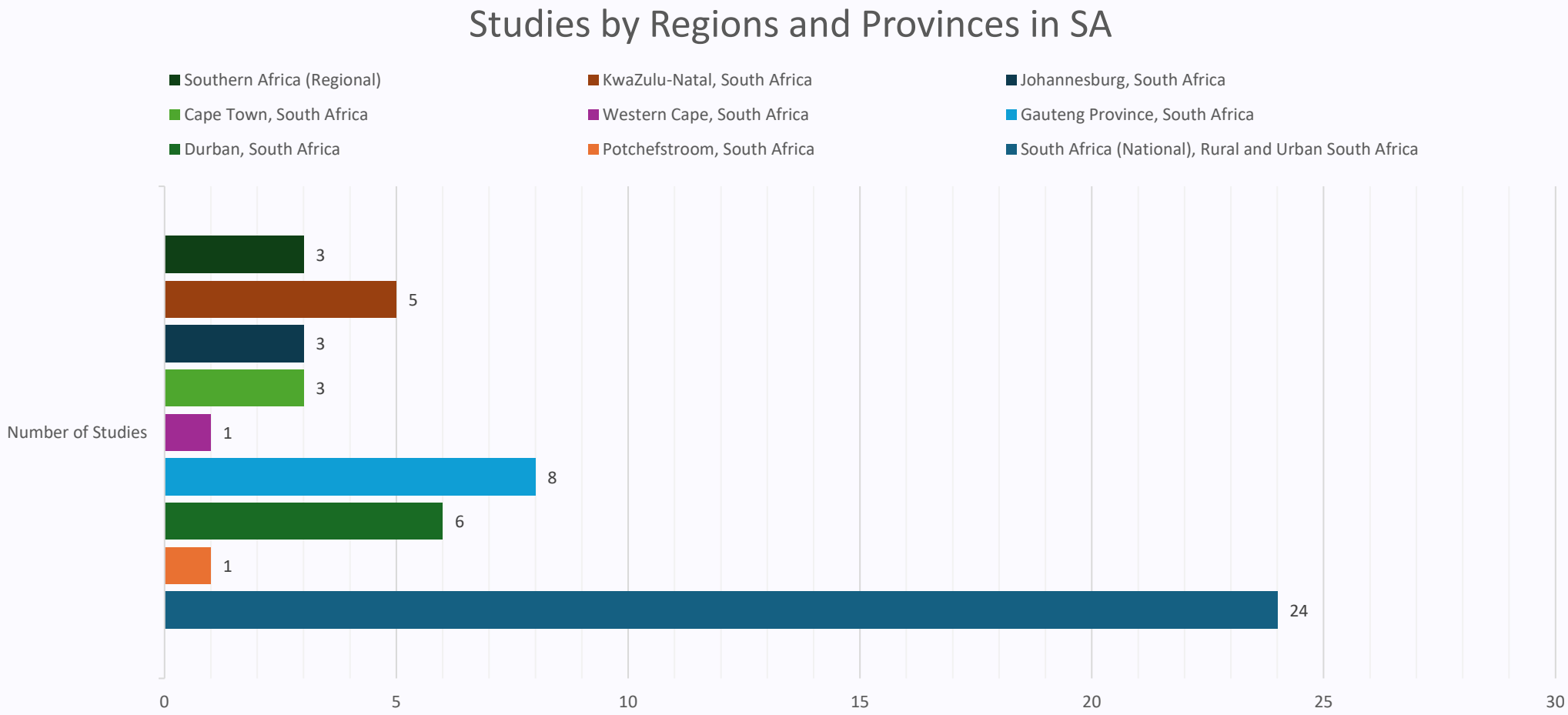

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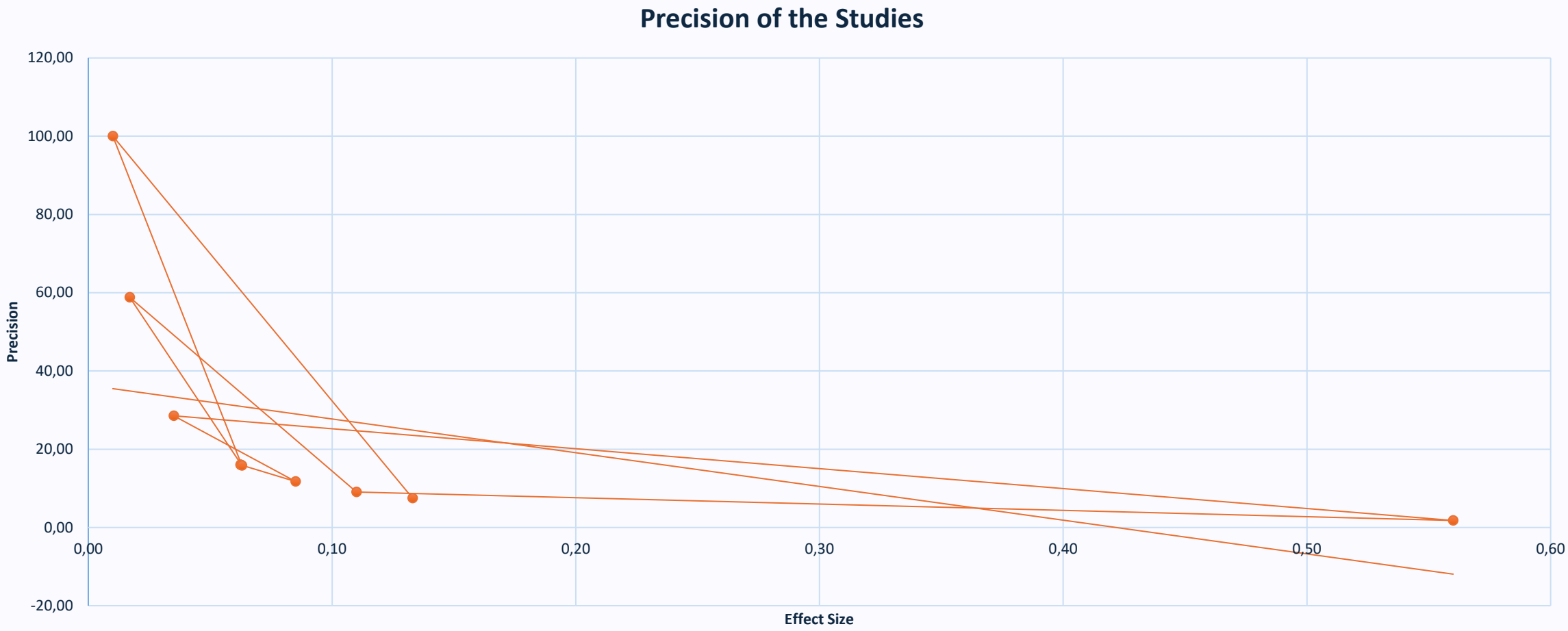

PRISMA 2020: Systematic Review Checklist Summary

(Adapted from Page et al., 2021)

SECTION	KEY REQUIREMENTS
Title & Abstract	Identify the study as a systematic review; follow PRISMA Abstract guidelines.
Introduction	Clearly state the rationale (context) and objectives (specific review questions).
Methods	Define eligibility criteria, information sources, search strategy, selection & data extraction processes, risk of bias tools, synthesis methods, effect measures, certainty & sensitivity assessments.
Results	Report study selection (flowchart), characteristics, bias assessments, synthesis outcomes, heterogeneity, and confidence in evidence.
Discussion	Interpret findings, limitations (of evidence & review), and implications for research/policy/practice.
Other Info	Include registration details, protocol access, funding, competing interests, and data/code availability.

Common pitfalls and ethical consideration

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COMMON PITFALLS & ETHICAL CONSIDERATIONS -1

TRANSPARENCY AND REPRODUCIBILITY

Poor protocol documentation

- Failing to pre-register detailed methods makes replication impossible

Inadequate search reporting

- Not providing complete search strategies prevents verification

Missing selection criteria

- Unclear inclusion/exclusion criteria lead to inconsistent study selection

Undocumented decision-making

- Not recording reasons for excluding studies reduces transparency

Incomplete data extraction details

- Vague descriptions of how data was collected and analyzed

MANAGING GREY LITERATURE

Access challenges

- Difficulty locating unpublished reports, theses, and conference proceedings

Quality assessment issues

- Harder to evaluate the methodological rigor of non-peer-reviewed sources

Search strategy complexity

- Requires different approaches beyond standard database searches

Documentation problems

- Grey sources may lack consistent bibliographic information

Bias introduction

- Risk of missing important negative results that remain unpublished

COMMON PITFALLS & ETHICAL CONSIDERATIONS - 2:

Selection Bias and Incomplete Search

Selection Bias

- Risk of excluding relevant studies due to narrow inclusion criteria or unintentional author bias.
- Skewed results if study populations or outcomes are not well-represented.

Incomplete Search Strategies

- Failure to search multiple databases or use comprehensive keywords.
- Ignoring unpublished or non-English studies limits findings.

COMMON PITFALLS & ETHICAL CONSIDERATIONS - 3:

Ethical Considerations

Integrity & Objectivity:	• Avoid cherry-picking studies to support a preferred outcome.
Authorship Ethics:	• Give proper credit; avoid ghost or honorary authorship.
Data Use & Confidentiality:	• When using unpublished or grey literature, ensure proper permission and citation.
Conflict of Interest Disclosure:	• Declare any financial or personal interests that may bias the review.
Inclusivity:	• Ethically justify study exclusions (e.g., language, geography) to avoid skewing evidence.

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