

## **Appendix 1 Interview Outline**

This outline is constructed based on Lipsky's street-level bureaucracy theory, aiming to reveal the service supply dilemmas faced by family doctors during major public health emergencies.

### **1. Discretion and Individual Decision-Making**

1.1 During the lockdown, did you encounter residents' needs that "could not be resolved by the rules but had to be addressed"? Please provide an example of how you balanced policy requirements with practical demands.

1.2 When resources were scarce (e.g., medicines, personnel), which patients' needs did you prioritize? What was the basis for your decision?

1.3 Have you ever adjusted your service approach due to pressure (e.g., resident complaints, performance evaluations)? Did these adjustments align with the original intent of the policy?

### **2. Resource Constraints and Adaptive Innovation**

2.1 Which resource shortages most severely affected service delivery during the lockdown? How did you or your team compensate for these gaps through informal means (e.g., cross-institutional coordination, mobilizing community resources)?

2.2 Describe a case where you "broke routine" to meet residents' medical needs (e.g., medication delivery, remote diagnosis). Was this innovation recognized by the system?

2.3 Do current performance metrics (e.g., contract signing rates, chronic disease management rates) conflict with the actual demands of emergency response? Please provide examples.

### **3. Policy Ambiguity and Implementation Tensions**

3.1 When implementing lockdown policies, what ambiguous or contradictory directives did you encounter? How did you interpret and act on these policies?

3.2 How did you allocate your efforts between "epidemic control" and "basic medical care" as a family doctor? Did policies provide clear guidance on this balance?

3.3 Do you believe the current top-level design of the family doctor system (e.g., medicine formularies, referral authority) limits emergency response capabilities?

### **4. Role Conflict and Professional Identity**

4.1 Do you identify more as a "primary health gatekeeper" or a "public health enforcer"? When do these two roles come into conflict?

4.2 Is there a gap between residents' expectations of family doctors (e.g., immediate responsiveness) and the duties assigned by policies? How do you cope with this pressure?

### **5. Policy Improvement Recommendations**

5.1 Based on your experience, which policy provisions urgently need revision to enhance emergency service capacity (e.g., medicine reserve mechanisms, emergency decision-making authority)?

5.2 What role do you think family doctors should play in the policy-making process? Are existing channels sufficient for frontline voices to be heard?

## Appendix 2 Standards for Reporting Qualitative Research (SRQR)

### Standards for Reporting Qualitative Research (SRQR)\*

<http://www.equator-network.org/reporting-guidelines/srqr/>

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no(s).

#### Title and abstract

|   |   |
|---|---|
| <b>Title</b> - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended | 1 |
| <b>Abstract</b> - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions   | 1 |

#### Introduction

|  |     |
|--|-----|
| <b>Problem formulation</b> - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement | 2-3 |
| <b>Purpose or research question</b> - Purpose of the study and specific objectives or questions  | 3   |

#### Methods

|  |     |
|--|-----|
| <b>Qualitative approach and research paradigm</b> - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**  | 3-4 |
| <b>Researcher characteristics and reflexivity</b> - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability | 4-6 |
| <b>Context</b> - Setting/site and salient contextual factors; rationale**  |     |
| <b>Sampling strategy</b> - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**  | 4   |
| <b>Ethical issues pertaining to human subjects</b> - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues  | 5   |
| <b>Data collection methods</b> - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**   | 4-5 |
| <b>Data collection instruments and technologies</b> - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study  | 3-4 |
| <b>Units of study</b> - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)   | 4-5 |
| <b>Data processing</b> - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts   | 5-6 |
| <b>Data analysis</b> - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**  | 5-6 |
| <b>Techniques to enhance trustworthiness</b> - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**   | 5-6 |

#### Results/findings

|   |      |
|---|------|
| <b>Synthesis and interpretation</b> - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory | 6-16 |
| <b>Links to empirical data</b> - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings   | 6    |

#### Discussion

|   |       |
|---|-------|
| <b>Integration with prior work, implications, transferability, and contribution(s) to the field</b> - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field | 16-19 |
| <b>Limitations</b> - Trustworthiness and limitations of findings  | 20    |

**Other**

|   |       |
|---|-------|
| <b>Conflicts of interest</b> - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed | 20-21 |
| <b>Funding</b> - Sources of funding and other support; role of funders in data collection, interpretation, and                                | 20-21 |

\*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

\*\*The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

**Reference:**

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. [Standards for reporting qualitative](#)

## Appendix 3 Theoretical Framework and Corresponding Dilemmas in Family Doctors' Service Delivery During COVID-19

Table 1 Theoretical Framework and Corresponding Dilemmas in Family Doctors' Service Delivery During COVID-19

| Theoretical Framework                           | Corresponding Dilemmas  | Specific Manifestations  | Theoretical Linkage   |
|---|---|--|---|
| 1. Discretion and Individual Decision-Making    | 3.2.2 Reduction of the discretionary power of family doctors                          | Family physicians' decision-making autonomy was constrained during the pandemic (e.g., mandatory task assignments, standardized protocols), limiting their ability to adapt services flexibly. | Discretion theory emphasizes street-level bureaucrats' autonomy, yet rigid policies during the pandemic reduced family doctors' individualized decision-making. |
|   | 3.2.3 Family doctors' prosocial deviant behavior tendency under dual pressure         | Family doctors may resort to "workarounds" (e.g., bending prescription rules, exceeding patient quotas) to meet patient needs.   | Prosocial rule-breaking reflects moral agency in conflict with policy rigidity, demonstrating informal coping strategies under constrained discretion.          |
| 2. Resource Constraints and Adaptive Innovation | 3.3.1 Resource scarcity leads to supply and demand contradiction                      | Shortages in medical supplies and personnel (e.g., medicines, testing kits) exacerbated the gap between service demand and capacity.   | Resource constraint theory posits that scarcity drives innovation; family doctors faced systemic shortages requiring improvised solutions.                      |
|   | 3.3.3 Creatively meet the needs of service objects under restrictions                 | Family doctors adopted alternative methods (e.g., telemedicine, community mutual aid) to compensate for resource gaps.   | Adaptive innovation is a hallmark of resource-limited settings, where providers develop non-traditional approaches to sustain care delivery.                    |
| 3. Policy Ambiguity and Implementation Tensions | 3.4.1 Ambiguity of family doctors' association with public policy                     | Unclear role definitions (e.g., whether family doctors should conduct testing or enforce quarantine) created confusion.  | Policy ambiguity theory suggests vague mandates lead to role ambiguity, resulting in inconsistent implementation.   |
|   | 3.2.4 The understanding of policies by family doctors and communication with citizens | Divergent interpretations of policies caused miscommunication between doctors and patients (e.g., conflicting explanations of prevention measures).  | Discrepancies in policy transmission highlight how ambiguity fuels tensions between implementers and beneficiaries.   |

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| 4. Role Conflict and Professional Identity | 3.2.1 Dual role and pressure of "state agent" and "people's agent"     | Family doctors struggled to balance government mandates (e.g., isolation enforcement) with patient advocacy (e.g., opposing excessive restrictions). | Role conflict theory underscores identity strain when professionals juggle competing institutional and client-centered obligations. |
|  | 3.3.4 Family doctors participate in community collaborative governance | Some doctors mitigated conflicts by engaging in community coordination (e.g., resource allocation negotiations).                                     | Collaborative governance can reconcile role conflicts by redefining professional identity through multi-stakeholder engagement.     |
| 5. Policy Improvement Recommendations      | 3.3.2 Policy implementation and redesign                               | Policies should be redesigned for flexibility (e.g., dynamic adjustments to family doctors' responsibilities).                                       | Policy improvement frameworks advocate institutional adaptations to address discretion and resource gaps.                           |
|  | 3.4.2 Supply chain difficulties of essential medicines                 | Emergency medicine reserve mechanisms should be established to mitigate shortages.   | Optimizing resource supply chains is a key lever for reducing operational strain on frontline providers.                            |
|  | 3.4.3 General medical training and career development path             | Training in public health emergencies and clearer career pathways would enhance professional capacity and identity.                                  | Professional development interventions can alleviate role conflict by strengthening competencies and institutional support.         |