# AI and Evidence-Based Policymaking: Who Stays in the Human-AI Loop and Why?

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## 1. Introduction

Science has long been essential for evidence-based public policymaking, with professional bureaucrats traditionally serving as the bridge between scientific knowledge and political decision-making. However, as AI is increasingly used to synthesize scientific evidence for policymakers, do human bureaucrats remain indispensable in this process? If retaining humans in the loop is crucial, who should they be, and why do their roles still matter?

Surprisingly, discussions of these important questions remain limited. While there is a broad consensus in the science community that humans should stay involved [1], the answer is neither simple nor straightforward—especially given that evidence-based policymaking has been filled with human biases. This study seeks to address these overlooked questions, contributing to the broader debate on AI's revolutionary impact on government and policymaking.

The study has both theoretical and practical implications. Theoretically, it develops a framework for understanding the human-AI loop in policymaking. Practically, as AI begins to replace government jobs, this study offers insights for political leaders on which type of bureaucrats remain essential in policymaking and the rationale for retaining them. In addition, bureaucrats themselves must adapt, learning how to collaborate effectively with AI to navigate this unprecedented transformation of government.

## 2. Substantial section

### 2.1 Literature Review (related work)

There are two main strands of literature related to AI's impacts on government bureaucracy and public policymaking.

The first stand examines how information and communication technologies (ICTs), including AI tools, have transformed conventional theories of bureaucracy. These studies focus on AI's impact on administrative discretion [2, 3, 4]. For example, Vogel et al. (2020) argue that with the rise of algorithmic bureaucracy in government (AI-assisted or fully automated decision-making), traditional street-level bureaucracy is being phased out. The algorithmic bureaucracy, functioning through adaptive predictive algorithmic models, has significantly reduced the discretionary power of street-level bureaucrats, who previously made critical decisions affecting citizens' well-being [2].

The second strand empirically explores how AI influences bureaucrats' decision-making. For example, Selton et al. (2022) found that police officers trust and follow AI recommendations when they are congruent with the police officers' intuitive professional judgment. However, the study found no effect of AI's explainability on shaping officers' judgment, suggesting that AI systems do not overturn intuitive professional judgments even when they are

transparent and well-explained [5].

Both strands of research underscore the need for a more nuanced understanding of the human-AI interplay, given the complex realities policymakers navigate and the evolving role of bureaucratic discretion.

### 2.2 Theoretical Framework

This study contributes to the literature by developing a framework for analyzing the human-AI interplay in evidence-based policymaking. This framework is built on two key elements, as illustrated in Figure 1.

Figure 1: Human-AI Relationships in Evidence-Based Policymaking



**(1) The need for procedural rationality**

According to Herbert Simon, individual decision-makers operate with bounded rationality, which organizations can mitigate through procedural rationality [6]. Procedural rationality ensures that decisions follow a logical and legitimate process, often through deliberation, consultation, and institutional norms. Real-world examples include the policy advisor system in the West or the democratic centralism in China. While AI-driven bureaucracy can help overcome bounded rationality at the individual level, it also risks undermining procedural rationality by bypassing deliberative processes that confer legitimacy to decisions. In this context, human bureaucrats play a crucial role in maintaining this legitimacy by ensuring that AI-driven decisions are scrutinized, debated, and aligned with fundamental regime values.

**(2) AI's vulnerability to technical bias**

Evidence-based policymaking has long been susceptible to biases—whether intentionally or unintentionally—introduced by human policymakers [7]. AI has great potential to mitigate human bias and prejudice by reducing selective interpretation and cherry-picking of scientific evidence. However, AI could also introduce its own technical bias or be leveraged to reinforce existing biases in the policymaking process [8]. Beyond technical flaws, AI models can also reflect systemic or political biases, as they are often trained on datasets shaped by existing power structures and policy preferences [9]. For example, politicians may use AI-generated evidence to control agenda-setting, and in the worst-case scenario, they could even manipulate the AI

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algorithms to serve their political objectives.

### 2.3 Methods

This study adopts a qualitative approach, with data primarily collected from two sources. Firstly, it conducts a text analysis of existing literature, with a particular focus on real-world case studies that have emerged as prominent examples of the human-AI interplay in policymaking. Since discussions on this topic remain limited and algorithmic bureaucracy is still in its early stages, leveraging real-world cases offers a more effective means of analysis, before surveys or experiments could be effectively designed for empirical analysis.

Secondly, interviews will be conducted with policymakers in Singapore, where AI tools are actively used to improve public service. Their insider's perspectives will provide valuable insights to complement the textual analysis. Additionally, interviews will be conducted with AI designers and coders in Singapore's tech sector to understand their views on AI's vulnerability to technical bias in policymaking.

### 2.4 Tentative Findings

(1) Who Stays in the Human-AI Loop?

Based on Figure 1, this study shows that human bureaucrats remain crucial in policymaking when AI tools exhibit high vulnerability to technical bias and there is a strong need for procedural rationality in the policymaking process.

Conversely, when AI's vulnerability to technical bias is low, AI can be entrusted with certain decision-making functions. However, human oversight remains desirable when procedural rationality is required. If both the need for procedural rationality and AI's susceptibility to bias are minimal, decision-making could be automated to a high degree, thus justifying the rise of the algorithmic bureaucracy in future governance.

(2) Why Do Bureaucratic Expertise Still Matter?

This study highlights two key dimensions of bureaucratic expertise that become increasingly crucial in the AI era.

a) Expertise bargains: AI-driven policymaking operates within existing structures of bureaucratic politics. Bureaucrats are not only domain professionals in specific policy areas but also skilled in navigating the transactional dynamics (bargains) between themselves and political leaders [10]. Such expertise is crucial for ensuring procedural rationality in policymaking.

b) Human-AI collaboration expertise: To mitigate AI's technical bias, human bureaucrats need to develop new competencies in effectively collaborating with A. This includes solid domain-specific knowledge and human intuition to identify and address AI-driven biases, as well as foundational AI literacy to facilitate effective collaboration with AI technocrats.

Policymaking is not just a technical process but also a political one, requiring deliberation, accountability, and legitimacy—elements that AI alone cannot fully replicate. Rather than replacing bureaucrats entirely, AI will reshape their roles, making human-AI collaboration essential.

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