

Knowledge Broker Roles and Uptake Success in Health Policy Units: Insights from Panel Analysis

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Abstract

The translation of academic research into actionable health policy remains a critical challenge in contemporary public administration and health systems management. This study investigates the mechanisms through which knowledge brokers facilitate the uptake of evidence-based interventions within health policy units. Utilizing a longitudinal panel data approach spanning a decade across multiple regional health authorities, the research analyzes the specific roles undertaken by knowledge brokers—namely, information dissemination, network building, and capacity development—and evaluates their differential impacts on policy uptake success. Drawing upon comprehensive administrative datasets and structured surveys from policy practitioners, the analysis demonstrates that network building and capacity development are significantly more influential in ensuring sustained policy adoption than mere information dissemination. Furthermore, the findings highlight the moderating effects of organizational readiness and institutional resource availability on the efficacy of knowledge brokering activities. By disaggregating the knowledge broker role and empirically testing its components over time, this paper contributes a nuanced understanding of evidence-to-policy pathways. The evidence presented herein provides actionable insights for public health institutions aiming to optimize resource allocation toward effective knowledge translation strategies and structural capacity building.

Keywords: Knowledge Brokering; Health Policy; Evidence Uptake; Panel Analysis; Policy Implementation

1. Introduction

1.1 Background and Context

The integration of scientific evidence into public policy is universally recognized as a foundational element of effective governance, particularly within the health sector where the stakes of policy decisions directly impact population morbidity and mortality. Despite the consensus on the importance of evidence-based policymaking, a persistent and well-documented gap remains between the production of rigorous academic research and its practical application in health policy arenas. Scholars and practitioners have long observed that high-quality research frequently fails to permeate the boundaries of governmental decision-making systems [1]. This phenomenon is often attributed to the inherently different cultures, incentive structures, and operational timelines that govern the scientific community and the political sphere. Researchers typically prioritize methodological rigor, peer validation, and

theoretical advancement, operating on extended timelines. Conversely, policymakers are driven by immediate political pressures, public sentiment, and rapid decision-making imperatives [2].

To bridge this formidable divide, the concept of knowledge translation emerged as a critical field of study and practice. Central to the operationalization of knowledge translation is the figure of the knowledge broker. Knowledge brokers are individuals or organizations whose explicit mandate is to facilitate the exchange of information, build relationships, and develop the capacity for evidence uptake between the producers of knowledge and its end-users [3]. Over the past two decades, health systems globally have increasingly invested in knowledge brokering initiatives, establishing dedicated policy units and specialized roles to systematically integrate evidence into legislative and administrative processes. However, while the theoretical appeal of knowledge brokers is strong, empirical evidence detailing exactly which brokering activities most effectively lead to successful policy uptake remains fragmented and largely anecdotal.

1.2 Research Objectives and Scope

The primary objective of this paper is to systematically examine the link between specific knowledge broker roles and the subsequent success of policy uptake within health policy units. Previous literature has often treated knowledge brokering as a monolithic intervention, failing to distinguish between the distinct types of activities that brokers perform on a daily basis [4]. This study disaggregates the knowledge broker function into three conceptually distinct roles: information dissemination, network building, and capacity development. By breaking down the brokering function, this research seeks to identify which specific mechanisms yield the highest return on investment in terms of actual policy change.

To achieve this, the study employs a rigorous panel analysis methodology, utilizing longitudinal data collected over a ten-year period from forty-five distinct health policy units. This longitudinal approach addresses a significant limitation in existing research, which has predominantly relied on cross-sectional surveys or isolated case studies that cannot adequately capture the time-delayed nature of policy implementation [5]. By tracking policy units over time, the analysis controls for unobserved, unit-specific characteristics and observes the dynamic relationship between brokering inputs and policy outcomes. The findings from this investigation are intended to inform public administration theory and provide pragmatic guidance for health authorities seeking to optimize their evidence-to-policy infrastructure.

2. Theoretical Framework and Literature Review

2.1 The Evolution of Knowledge Translation Theory

The conceptualization of how knowledge moves from research into practice has evolved significantly over the past half-century. Early models of knowledge translation were predominantly linear and unidirectional, assuming that if researchers produced rigorous, high-quality evidence and communicated it clearly, policymakers would naturally adopt and implement it [6]. This rational-actor model, often referred to as the knowledge-driven or push model, placed the onus of translation almost entirely on the scientific community. However, empirical observations quickly revealed the inadequacies of this perspective, as many exceptionally well-crafted studies languished in academic journals without ever influencing practice.

Subsequent theoretical developments introduced the concept of the pull model, where policymakers actively seek out research to solve specific, pre-defined problems. While this model acknowledged the

agency of decision-makers, it still failed to capture the messy, iterative, and highly politicized nature of the policy process. Contemporary knowledge translation theory has thus shifted toward complex adaptive systems and linkage-and-exchange models [7]. These modern frameworks posit that knowledge utilization is a relational and interactive process, highly dependent on the social and institutional contexts in which both researchers and policymakers operate. Within this interactive paradigm, the boundary-spanning role of the knowledge broker becomes theoretically indispensable [8]. Brokers are theorized to act as catalysts within these complex systems, navigating institutional barriers and aligning the disparate lifeworlds of science and governance.

2.2 Conceptualizing the Knowledge Broker Role

The literature identifies several distinct roles that knowledge brokers may assume, depending on their mandate, resources, and institutional embeddedness. This study categorizes these functions into three primary domains based on the foundational typology established in public policy literature [9].

The first role is information management and dissemination. In this capacity, knowledge brokers act as filters and synthesizers. They scan vast amounts of academic literature, extract the most relevant and robust findings, and translate complex methodological jargon into accessible formats such as policy briefs, executive summaries, and infographics. The underlying assumption of this role is that decision-makers lack the time and technical expertise to process primary research, and that tailored packaging will increase the likelihood of consumption [10].

The second role is network building and linkage. Here, the knowledge broker acts as a relationship manager and a human bridge. Activities include organizing joint workshops, facilitating regular dialogue between academic departments and government ministries, and fostering informal communication channels. This role addresses the cultural divide by building mutual trust, understanding, and shared goals over time. Theorists argue that evidence is more likely to be utilized if the user has a personal, trusting relationship with the producer or the intermediary [11].

The third role is capacity development. This is arguably the most intensive and transformative function. In this capacity, knowledge brokers work directly with policy units to enhance their internal ability to access, appraise, and apply research evidence independently. Activities include running training seminars on research methodologies, assisting in the development of institutional guidelines for evidence appraisal, and mentoring policy analysts [12]. The goal is to create sustainable, structural change within the policy unit, moving beyond the facilitation of single knowledge transactions to building long-term organizational readiness.

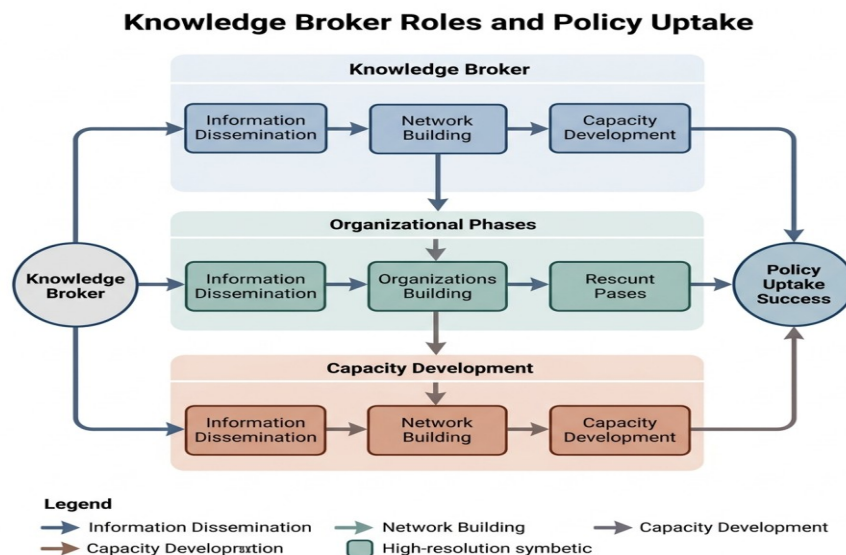


Figure 1: Conceptual Framework of Knowledge Broker Roles and Policy Uptake

2.3 Determinants of Uptake Success in Health Policy

Defining and measuring uptake success in public policy is notoriously challenging due to the diffuse and often indirect ways in which evidence influences decisions. The literature distinguishes between instrumental use, where research directly shapes a specific policy choice; conceptual use, where research subtly alters how policymakers think about an issue over time; and symbolic or tactical use, where research is used ex post to justify a decision made for political reasons [13].

Furthermore, the success of any knowledge brokering initiative is heavily contingent upon the receiving environment. Institutional factors such as organizational culture, leadership support, and resource constraints play a critical role in moderating the impact of brokering activities [14]. A policy unit characterized by high staff turnover, rigid hierarchies, and intense political scrutiny may be structurally resistant to evidence-based interventions, regardless of the competence of the knowledge broker. Consequently, any robust empirical analysis of knowledge brokering must account for these contextual variables to isolate the true effect of the brokering interventions.

3. Methodology and Data Collection

3.1 Research Design and Panel Structure

To systematically investigate the relationship between knowledge broker roles and uptake success, this study employs a quantitative longitudinal panel design. The dataset comprises annual observations from forty-five distinct health policy units across diverse regional jurisdictions over a ten-year period, from 2012 to 2022. This yields a strongly balanced panel of four hundred and fifty unit-year observations.

The selection of health policy units was stratified to ensure representation across various sub-domains of public health, including infectious disease control, maternal and child health, chronic disease management, and health systems financing [15]. A longitudinal design was specifically chosen because the process of policy uptake is inherently time-dependent. Cross-sectional data cannot capture the lag between a knowledge broker's intervention, such as a capacity-building workshop, and the eventual integration of evidence into a legislative or administrative act. By observing the same units

over a decade, the analysis can model these temporal dynamics and control for time-invariant, unit-specific confounding factors.

3.2 Variable Measurement and Operationalization

The dependent variable for this study is the Uptake Success Score, a composite index developed to quantify the extent to which evidence has been integrated into policy outputs within a given year. The Uptake Success Score is calculated based on a weighted aggregation of three indicators: the frequency of academic citations in official policy documents, the successful implementation of evidence-based clinical or administrative guidelines, and the allocation of budgetary resources toward interventions recommended by synthesized research evidence. The score is normalized on a continuous scale from zero to one hundred, where higher values indicate more substantial and systematic evidence uptake [16].

The primary independent variables represent the intensity of the three knowledge broker roles: Information Dissemination, Network Building, and Capacity Development. These variables were measured through standardized annual surveys administered to both the knowledge brokers assigned to the respective policy units and the senior policy analysts working within those units. Respondents rated the frequency and intensity of specific activities associated with each role on a continuous scale. To ensure reliability, self-reported survey data were cross-validated with administrative logs of broker activities, such as the number of policy briefs published, the number of joint meetings facilitated, and the hours of training delivered.

Several control variables were included to account for contextual factors that might influence policy uptake independent of the broker's actions. These include Unit Size, measured by the number of full-time equivalent staff; Budget Availability, measured by the annual discretionary funding available to the unit; and Organizational Readiness, a validated index capturing leadership support and institutional culture regarding evidence-based practice.

Table 1: Summary Statistics of Key Variables across Health Policy Units

Variable Name	Mean	Standard Deviation	Minimum	Maximum
Uptake Success Score	54.32	18.45	12.00	94.50
Information Dissemination Index	68.15	14.22	25.00	98.00
Network Building Index	45.70	21.30	5.00	92.00
Capacity Development Index	38.45	24.18	0.00	88.50
Unit Size (Staff Count)	42.50	15.60	10.00	120.00
Organizational Readiness Index	55.80	16.75	18.00	89.00

3.3 Analytical Procedures

The core analytical strategy relies on fixed-effects panel regression models. The fixed-effects specification is particularly appropriate for this study as it controls for all unobserved, time-invariant differences between the health policy units, such as historical institutional culture, geographical location, and deeply entrenched political ideologies [17]. By focusing exclusively on within-unit variation over time, the model isolates the impact of changes in knowledge brokering activities on changes in policy uptake success.

To address potential issues of reverse causality—whereby units with high policy uptake might subsequently attract or demand more knowledge brokering services—the independent variables and

time-varying controls were lagged by one year. This temporal sequencing ensures that the measured brokering activities preceded the observed policy outcomes. Standard errors were clustered at the policy unit level to account for potential autocorrelation and heteroskedasticity within the panels. Additional diagnostic tests, including the Hausman test, confirmed the appropriateness of the fixed-effects model over a random-effects specification.

4. Panel Analysis Results and Discussion

4.1 Descriptive Trends and Baseline Findings

The descriptive statistics, as presented in the previous section, reveal significant variations in the types of activities prioritized by knowledge brokers. The Information Dissemination Index exhibits the highest mean score, indicating that producing briefs and synthesizing research is the most common and consistent activity performed by brokers across the sample. Conversely, the Capacity Development Index has the lowest mean and the highest standard deviation, suggesting that intensive training and structural empowerment are less frequently deployed and vary wildly depending on the specific mandate of the unit.

Table 2 presents the results of the baseline fixed-effects panel regression models. Model 1 introduces each knowledge broker role independently alongside control variables, while Model 2 includes all three roles simultaneously to assess their relative contributions while holding the others constant.

Table 2: Baseline Fixed-Effects Panel Regression Results on Uptake Success

Independent Variables	Model 1 Coefficients	Model 1 Standard Error	Model 2 Coefficients	Model 2 Standard Error
Information Dissemination (Lagged)	0.15	0.08	0.06	0.09
Network Building (Lagged)	0.38	0.10	0.31	0.11
Capacity Development (Lagged)	0.45	0.09	0.39	0.10
Organizational Readiness	0.28	0.06	0.25	0.07
Unit Size	0.04	0.03	0.03	0.03

The empirical results reveal striking disparities in the effectiveness of the different brokering roles. When analyzed simultaneously in Model 2, the coefficient for Information Dissemination diminishes significantly and loses its statistical robustness. This finding suggests that while disseminating tailored information is the most common brokering activity, it is, in isolation, the least effective mechanism for driving actual policy uptake. This aligns with recent critical literature suggesting that the bottleneck in evidence-based policymaking is rarely a lack of accessible information, but rather a lack of relational trust and institutional capability to act upon that information [18].

4.2 Disaggregating Knowledge Broker Interventions

In stark contrast to information provision, both Network Building and Capacity Development exhibit strong, positive, and statistically robust associations with the Uptake Success Score. A one-unit increase in the Network Building Index is associated with a 0.31-unit increase in subsequent policy uptake, holding other factors constant. This underscores the fundamental importance of relational dynamics in public administration. Policymakers are significantly more likely to adopt evidence when it is championed through trusted, established networks rather than delivered impersonally via documents. Knowledge brokers who invest time in facilitating face-to-face interactions, mediating disputes, and

building long-term collaborative bridges between academic institutions and health ministries generate a much higher return on investment.

Furthermore, Capacity Development emerges as the most potent driver of policy uptake, with a coefficient of 0.39. Interventions that focus on teaching policy analysts how to source, evaluate, and integrate data into their workflow appear to create a compounding effect over time. By elevating the internal analytical capability of the health policy unit, the knowledge broker reduces the unit's perpetual dependency on external intermediaries. This capacity building transforms the organizational culture, making the unit structurally more receptive to scientific evidence in the long run.

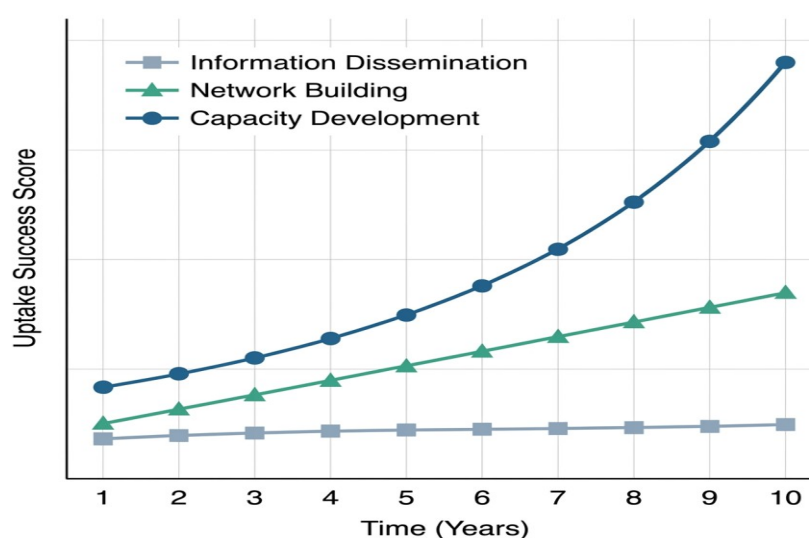


Figure 2: Longitudinal Impact Trends of Knowledge Broker Roles on Policy Uptake

4.3 Robustness Checks and Contextual Factors

To ensure the reliability of these findings, several robustness checks were conducted. Table 3 presents alternative specifications, including a model utilizing a two-year lag structure to account for particularly slow-moving legislative processes, and a model incorporating an interaction term between Capacity Development and Organizational Readiness.

Table 3: Robustness Checks using Alternative Specifications

Independent Variables	Two-Year Lag Model	Standard Error	Interaction Model	Standard Error
Information Dissemination	0.04	0.09	0.05	0.09
Network Building	0.34	0.12	0.29	0.11
Capacity Development	0.42	0.11	0.18	0.14
Capacity * Readiness Interaction	-	-	0.08	0.03
Organizational Readiness	0.22	0.08	0.15	0.09

The two-year lag model confirms that the effects of Network Building and Capacity Development are not ephemeral but persist and even strengthen over extended time horizons. The policy process is inherently protracted, and these results validate the necessity of sustained, multi-year funding for knowledge brokering initiatives rather than short-term project grants.

The interaction model yields particularly illuminating insights regarding contextual dependencies. The positive and significant interaction term between Capacity Development and Organizational Readiness indicates that capacity-building efforts are exceptionally effective in units that already possess a baseline culture of leadership support for evidence use. Conversely, in highly resistant or dysfunctional units, even intensive capacity-building efforts by the knowledge broker struggle to gain traction. This suggests a threshold effect: knowledge brokers cannot single-handedly fix deeply broken administrative structures. For maximum efficacy, health authorities must simultaneously address institutional culture and deploy specialized brokering personnel [19].

5. Conclusion and Policy Implications

5.1 Summary of Key Findings

This comprehensive panel analysis provides robust empirical evidence regarding the mechanisms through which knowledge brokers influence the uptake of scientific evidence in health policy units. By disaggregating the knowledge broker role and tracking outcomes longitudinally across forty-five distinct units, the study reveals that not all brokering activities yield equal results. The traditional, and most frequently deployed, model of information dissemination—characterized by the production of policy briefs and evidence summaries—demonstrates limited independent impact on sustained policy change. In contrast, activities centered on network building and intensive capacity development emerge as the primary drivers of successful evidence translation. The data unequivocally show that fostering relational trust between researchers and policymakers, and structurally elevating the internal analytical capabilities of government units, are far superior strategies for embedding science into public administration.

5.2 Recommendations for Health Policy Units

The findings hold several critical and actionable implications for public health administrators, funding agencies, and institutional designers. First, there must be a strategic reallocation of resources within knowledge translation portfolios. Health ministries and funding bodies should pivot away from funding passive information packaging and instead invest heavily in interactive, relationship-based brokering initiatives. Knowledge brokers should be hired and evaluated not on the volume of documents they produce, but on their ability to convene stakeholders, facilitate collaborative partnerships, and mentor government personnel.

Second, the design of knowledge broker mandates must explicitly incorporate capacity development as a core responsibility. Job descriptions for boundary spanners should require pedagogical skills and organizational development expertise, moving beyond simple scientific literacy. Finally, institutional leaders must recognize their role in preparing the organizational soil. Because the efficacy of knowledge brokering is highly contingent upon baseline organizational readiness, executive leadership must actively foster a culture that rewards the integration of research evidence into workflow processes.

5.3 Limitations and Future Research Directions

While this study benefits from a robust longitudinal design, several limitations must be acknowledged. First, the measurement of the Uptake Success Score, though composite and rigorously defined, relies partially on self-reported survey data, which inherently carries the risk of social desirability bias. Although cross-validated with administrative logs, capturing the conceptual or subtle tactical uses of evidence remains methodologically challenging. Second, the findings are derived specifically from health policy units. While public health is a prominent domain for evidence-based

practice, the institutional dynamics in other sectors, such as environmental regulation or economic policy, may differ, potentially limiting the generalizability of the specific coefficients observed here.

Future research should prioritize comparative, cross-sectoral panel studies to determine if the supremacy of capacity building and network formation holds true in different political and administrative contexts. Additionally, qualitative research methodologies, such as in-depth ethnographies of knowledge brokers embedded within legislative committees, could provide granular insights into the micro-interactions that constitute successful network building. Ultimately, advancing the science of knowledge translation requires a continued commitment to rigorous, longitudinal evaluations that look inside the black box of policy implementation to understand exactly how evidence transforms into action.

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