

EXPLORING ETHNIC DIVERSITY AS A CATALYST FOR INNOVATION IN MALAYSIA'S PUBLIC HEALTHCARE

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ABSTRACT

This research delves into the influence of ethnic diversity on innovation within Malaysian public healthcare facilities. It explores how ethnic diversity within healthcare teams influence innovation. Employing a mixed-methods approach combining quantitative and qualitative data, this study first conducted multiple regression analysis on survey data collected from healthcare professionals across diverse facilities, followed by in-depth key informant interviews for qualitative exploration and validation of the quantitative findings, to evaluate the influence of ethnic diversity on levels of innovation at various Malaysian healthcare facilities. The results showed a positive correlation between ethnic diversity within healthcare teams and innovation levels. Teams comprising diverse ethnic backgrounds demonstrate a propensity for generating inventive solutions to healthcare challenges and exhibit heightened problem-solving capabilities. The study underscores the significant positive influence of minority ethnic category within teams as a pivotal driver of innovation in Malaysian public healthcare facilities at Ministry, State Health Department, Hospitals, Clinics and Health Institutions.

Keywords: Innovation; ethnic diversity; public healthcare sector

INTRODUCTION

Innovation is pivotal to enhancing the efficiency, quality, and accessibility of healthcare services. In Malaysia, public healthcare facilities face significant pressures due to an aging population, a growing prevalence of chronic diseases, and escalating demands for affordable and accessible healthcare services. In this context, innovation is not merely beneficial but essential to sustain and improve healthcare delivery amidst these challenges (see Omachonu & Einspruch, 2010). However, the healthcare sector's complex nature presents numerous hurdles to innovation, including regulatory barriers, information asymmetry, resource constraints, and an inherent resistance to change, all of which are further complicated by the rigid bureaucratic and financial structures of public healthcare systems (Bardach et.al, 2022).

Ethnic diversity within public healthcare facilities is a significant but underexplored aspect that may influence innovation. Malaysia's rich ethnic mosaic, characterised by a blend of Malay, Chinese, Indian, and other indigenous populations, presents a unique opportunity to examine how ethnic diversity intersects with innovation practices. This diversity not only shapes the workplace dynamics but also influences the innovation processes and outcomes within healthcare settings. Research indicates that ethnic diversity can enhance inventiveness and drive higher-quality decision-making due to varied perspectives and problem-solving approaches (Kanya & Johan, 2025).

Ethnic diversity's potential impact on innovation in healthcare is multifaceted. It can influence the development and implementation of new ideas, practices, and technologies in

several ways. Firstly, diversity in innovation teams is likely to bring a broader range of knowledge and perspectives, which can foster creative solutions to complex healthcare challenges. Secondly, the inclusion of diverse ethnic groups within healthcare teams enhances cultural competence in the services provided, thereby contributing to improved patient satisfaction and outcomes (Harrison et.al, 2019). Moreover, ethnic diversity within innovation teams can contribute to more robust and inclusive policy-making processes that reflect the needs and preferences of a broader cross-section of society, thereby enhancing the societal relevance and acceptance of innovations (Daya, 2014). Despite these potential benefits, the contribution of ethnic diversity to innovation is not straightforward. Several barriers may impede the positive influence of ethnic diversity on innovation. These barriers include linguistic differences, cultural misunderstandings, and potential biases that may lead to conflict or inefficiencies unless effectively managed (Stahl & Maznevski, 2021). Additionally, the degree to which diversity influences innovation may depend significantly on organisational culture, leadership support, and the presence of inclusive policies that promote equity and integration within the workplace (Al-Monawer, 2024).

Ethnic diversity has become increasingly important in the workplace, including in the public healthcare sector. Malaysia is an ethnically diverse country and promoting diversity in the healthcare sector can have a significant impact on improving health outcomes and enhancing innovation in the sector. To understand the dynamics of innovation within Malaysian public healthcare facilities, it is essential to acknowledge the distinct context of the public sector, particularly in contrast to the private sector. Unlike the profit-driven motives of the private sector, the public sector prioritizes organizational and societal welfare by enhancing service quality and efficiency. The objectives of the public sector revolve around maximizing customer satisfaction, ensuring fairness, and promoting equality in the distribution of services. Trust and legitimacy play crucial roles in fostering accountability and meeting the diverse needs of clients (Mulgan, 2007)

Malaysia is a multicultural nation, with Malays, Chinese, Indians and Indigenous groups being the main ethnic groups. Ethnic diversity in the public healthcare sector can provide a range of perspectives and ideas that can lead to innovation and improved health outcomes. However, diversity alone is not enough to promote innovation. Public policy plays a significant role in developing this human capital, which can become more innovative through the capital derived from supportive work environment, inclusive leadership that encourages collaborative teamwork. Sustaining high levels of innovation necessitates substantial research and development (R&D) investment, followed by an extensive and costly process to develop and commercialize marketable products and services (Yusuf2007).

Overall, ethnic diversity can be a crucial factor in promoting innovation in healthcare facilities. By fostering inclusivity, effective communication, and knowledge sharing, healthcare organizations in Malaysia can harness the benefits of ethnic diversity to drive innovation. However, it is important to note that the relationship between ethnic diversity and innovation is complex and may be influenced by various contextual factors such as communication and conflict management. Therefore, healthcare organizations must develop effective strategies that are tailored to their specific context to promote innovation by harnessing on ethnic diversity. In the Malaysian context, public sector innovation within healthcare facilities operates at various interfaces, including interactions between the public and private sectors, citizens, governmental levels, and different geographical and domain-specific divisions. These interfaces influence decision-making structures and shape the innovation landscape within public healthcare institutions. For this study, we specifically focus on the interfaces between local (District Health Offices & Health Institutions), regional (State Health Department), and national (Ministry level) levels within the public healthcare sector to explore the intricacies of innovation.

Given these complexities in analysing the value of ethnic diversity in public healthcare innovation, this paper critically examines the role of ethnic diversity as an enabler of innovation within Malaysian public healthcare facilities, employing an intersectional framework to unpack the nuanced ways in which ethnic diversity interacts with organizational practices and innovation outcomes. Through this analysis, the research seeks to contribute to a deeper understanding of how harnessing ethnic diversity can drive innovation and improve healthcare delivery in Malaysia's public healthcare facilities.

LITERATURE REVIEW

Ethnic Diversity in Malaysian Public Healthcare Sector

Ethnic diversity has become increasingly important in the workplace, including the public healthcare sector. Malaysia has a diverse population with different ethnic backgrounds and cultures, and promoting diversity in the healthcare sector can have a significant impact on improving health outcomes and enhancing innovation in the sector. This literature review aims to examine the existing research on ethnic diversity in the Malaysian public healthcare sector and the impact of diversity on the sector's innovation.

Malaysia is a multicultural society, with Malays, Chinese, Indians and East Malaysians being the main ethnic groups. Ethnic diversity in the public healthcare sector can provide a range of perspectives and ideas that can lead to innovation and improved health outcomes. Gomez and Bernet (2019) examined evidence from hospitals and other healthcare organisations and found that having a more racially and ethnically diverse workforce and leadership team is linked to better organisational outcomes, including stronger innovation in both services and products. Their analysis indicates that hospitals with more diverse governing boards tend to report higher innovation performance. The authors argue that teams composed of individuals from varied backgrounds, race, age, ethnicity and educational background contribute to greater creativity, more comprehensive risk evaluation, and enhanced problem-solving factors that collectively support innovation in healthcare delivery. However, studies have shown that cultural differences persist both within and between groups, even among similar cultures, and counselling philosophies that highlight individual differences take this into account. Culture is ingrained in individuals' daily activities, often unconsciously, and this perspective helps explain why responses to mandated counselling can vary based on cultural differences. These differences are influenced by physical boundaries, beliefs, and values unique to each culture (Abu Talib, 2009).

However, diversity alone is not enough to promote innovation. Public policy plays a pivotal role in advancing human capital through innovation, as government entities design and implement strategies that drive economic growth. The advancement of human capital through innovation is crucial for enhancing the efficiency and quality of public services, reducing societal inequalities, and promoting sustainable development within a country (Ilyina, 2024). Creativity must then translate into innovation, supported by urban amenities, services, and labour markets. Sustaining high levels of innovation necessitates substantial R & D investment, followed by an extensive and costly process to develop and commercialize marketable products and services (Yusuf, 2007).

According to Hong (2017), representativeness within law enforcement institutions transcends symbolic diversity and plays a critical role in strengthening organizational integrity. A more inclusive composition that reflects ethnic diversity enables minority officers to participate meaningfully in dialogue surrounding sensitive or controversial matters, thereby fostering accountability and ethical reform. Such inclusion gradually cultivates attitudinal and behavioural changes throughout the organization, particularly in interactions with minority communities.

Riccucci and Van Ryzin (2017) examine how the ethnicity and gender of public bureaucrats' influence both the effectiveness and perceived legitimacy of public services. Their research advances the theory of representative bureaucracy by providing empirical evidence that these demographic factors meaningfully shape public service delivery and trust. Recent scholarship highlights the importance of symbolic representation, proposing that the mere presence of a demographically reflective bureaucracy can positively affect client attitudes and behaviours even without direct policy interventions or behavioural changes among bureaucrats.

THEORETICAL FRAMEWORK

We draw upon the work of Omachonu and Einspruch (2010) to explore the dynamic relationship between ethnic diversity and innovation within Malaysian public healthcare facilities. Omachonu and Einspruch (2010) underscore the significance of healthcare industry innovations designed to improve life expectancy, quality of life, diagnostic and treatment options, as well as the efficiency and cost-effectiveness of the healthcare system. Despite the increase in innovations, there has been limited theoretical research on the principles and methods of healthcare innovation. They developed a conceptual framework that identifies the variables influencing healthcare innovation. Drawing on this framework, we aim to uncover the nuanced interplay between ethnic diversity and innovation within Malaysian public healthcare facilities. Ethnic diversity, as a fundamental aspect of Malaysia's social fabric, influences organizational dynamics, decision-making processes, and ultimately innovation.

We are also guided by the concept of intersectionality, initially coined by Kimberlé Crenshaw in the context of feminist theory, which offers a valuable lens through which to explore how overlapping social identities and systemic inequalities impact experiences and outcomes (Crenshaw, 1989). In the Malaysian healthcare context, applying an intersectional perspective to the study of ethnic diversity and innovation involves examining how intersecting social categories such as ethnicity, and other socio-demographic factors interact within innovation teams. This approach acknowledges that the impacts of ethnic diversity are not uniform but mediated by factors such as socio-economic status, cultural backgrounds, and institutional practices, which can either enable or hinder the innovation process. By adopting an intersectional lens, we seek to unravel how ethnic diversity shape innovation trajectories within the healthcare setting. We aim to shed light on the intricate mechanisms in which ethnic diversity enables or inhibits innovation, contributing to a more nuanced understanding of innovation dynamics in multicultural public healthcare environments.

In addition, drawing on Mulgan's (2007) typology of public sector innovation, which includes service, administrative, conceptual, policy, and systemic innovations, we aim to categorize and measure innovation in this manner within Malaysian public healthcare facilities. These dimensions encompass a spectrum of innovations ranging from improvements in service delivery to changes in organizational strategies and policy reforms, providing a comprehensive framework for assessing innovation.

Moreover, the necessity to measure public sector innovation has gained traction globally, as evidenced by initiatives such as the "Measuring Public Sector Innovation in the Nordic Countries (MEPIN)" project. This landmark study established standardized metrics for evaluating public sector innovation across Nordic countries, contributing significantly to the understanding and evaluation of innovation processes within public sector organizations. By adapting frameworks like the Oslo Manual and innovation measurement methodologies, studies like MEPIN provide valuable insights into the innovation landscape of public healthcare facilities (Bloch & Bugge, 2013).

METHODS

This study adopted an explanatory sequential mixed-methods design to ensure robust and comprehensive data collection and analysis. A quantitative analysis was conducted using multiple regression analysis to examine three key factors influencing innovations in Malaysian public healthcare facilities and they are: (i) the ethnic diversity of the innovation team, (ii) the ethnic background of the team leader, and (iii) the grade or position held by the team leader. These independent variables were selected based on theoretical and policy relevance, particularly in the Malaysian context where ethnic diversity and hierarchical structures are central to organizational dynamics and may influence innovation.

To support and deepen the interpretation of these quantitative findings, the second phase of the study involved qualitative data analysis through key informant interviews. A purposive sample of ten team leaders from successfully implemented innovation initiatives in public healthcare facilities was interviewed. These interviews offered rich, contextual insights into team interactions, leadership approaches, and institutional factors that shaped the innovation process. The integration of these qualitative insights with the statistical findings enabled a more nuanced understanding of how ethnic composition and team structure influence innovation in Malaysia's public healthcare system.

Sample selection and data collection

The research began with the formulation of a structured questionnaire, distributed to a target sample of 500 respondents across various healthcare facilities under the Ministry of Health. The selected respondents are members of innovation teams who have successfully implemented innovation across different healthcare facilities in Malaysia. The selection criteria aimed to encompass a diverse range of positions and responsibilities within these teams to capture a wide spectrum of insights on innovation.

From January 1, 2019, to March 31, 2019, data collection took place, utilizing an online platform (Google Forms) to facilitate ease of distribution and completion. Out of the 500 distributed questionnaires, 302 were completed and returned. However, data cleaning led to the exclusion of 25 respondents due to duplications or incomplete responses, leaving 277 valid questionnaires for analysis (see Table 1).

Table 1: Questionnaires Distributed, Completed and Cleaned

Health Facility	Questionnaires Distributed	Completed Questionnaires
Ministry	32	10
State Health Department	15	15
District Health Office	167	66
Hospitals	135	96
Clinics	151	115
Total	500	302
Cleaned Responses		277

Measures and questionnaire design

The questionnaire was developed based on the 'Measuring Public Sector Innovation in the Nordic Countries (MEPIN)' framework, known for its effectiveness in capturing data on public sector innovation. The questions were designed to gauge various aspects of innovation, including the types of innovation implemented, the demographic makeup of innovation team (ethnic diversity), and the perception of this team towards innovation.

The questionnaire included both quantitative and qualitative measures as shown in Table 2. To measure the factors affecting public sector innovation, we used similar measurement tools as used in the Nordic research project “Measuring Public Sector Innovation in the Nordic Countries (MEPIN)”. The ‘MEPIN’ framework was used to collect comparable data on innovation in the public sector. The questionnaire used in the study also adopted the ‘MEPIN’ questionnaire style.

Based on a cross-sectional survey, the questionnaire measured perceptions of public sector healthcare officials from the various work levels and grades. Data on Respondent Profile, Types of Innovation, Respondent Feedback and Perception on Types of Innovation and its Relationship with Ethnic Diversity were collected and tested for normality and reliability tests.

Table 2: Description of Measures

Measure	Question	Source
Number of various ethnicities in innovation teams to measure ethnic diversity	Please indicate your ethnicity <ul style="list-style-type: none"> • Malay • Chinese • Indian • Eastern Malaysian • Others 	Nordic research project “Measuring Public Sector Innovation in the Nordic Countries (MEPIN)”. The ‘MEPIN’ framework was used to collect comparable data on innovation in the public sector. The questionnaire used in the study also adopted the ‘MEPIN’ questionnaire style.
Health facility level of the respondents	Which best describes your level of responsibility? (Mark one option only) <ul style="list-style-type: none"> • Ministry • State Health Department • Hospital • Clinic • Health Institution 	MEPIN
Identify the main types of innovation at Malaysian Public Healthcare facilities	Briefly describe the innovations successfully implemented by your organisation. (From 2013-2017)	MEPIN
Categorisation of main types of innovation	How do you categorize innovation achieved by your organisation? (Choose one most relevant innovation in your organisation from 2013-2017 and only answer innovation questions in the relevant	MEPIN

Measure	Question	Source
	<p>section. You can mark more than one innovation).</p> <ul style="list-style-type: none"> • Product and Services Innovation • Process Innovation • Information and Communication Technology Innovation • Policy Innovation 	
Categorization of most significant types of innovation at various healthcare facilities	<p>Did your department implement any new or substantial changed processes in the last 5 fiscal year? (Mark all that applies and elaborate)</p> <ul style="list-style-type: none"> • Product and Services Innovation • Process Innovation • Information and Communication Technology Innovation • Policy Innovation 	MEPIN
Qualitative measurement on the importance of ethnic diversity in innovation with reasoning	<p>Do you perceive Ethnic Diversity as an important factor in public sector innovation?</p> <ul style="list-style-type: none"> • Agree (Why) • Disagree (Why) 	MEPIN

Source: Adapted from the MEPIN Instrument

RESULTS

Quantitative findings

Based on Table 3 below, descriptive statistics, the Normality test for Ethnic Diversity category showed that the mean of the respondents was higher than the median. As such, in accessing the central tendency of the data, the data was skewed to the left. This could be because the Malay respondents represent almost half of the population. Standard Deviation measures the central tendency of a data, or in other words, it analyses how to spread out a normally distributed set of data. The smaller the value of normal distribution the steeper bell curve and the larger the number, the flatter the distribution of the data. The sample standard deviation value for the data set is 3.34, which should be read together with mean/average, which reflected spread of the data from the mean or in other words, the measurement of central tendency. In this instance, the standard deviation was 3.34 points more and less scattered around the sample mean value of 55.4 which indicated that 93.3% of the Ethnic Diversity was normally spread around the mean value. As such the data on Ethnic Diversity passed the normality test and is fit to be used for the research.

Table 3: Descriptive Statistics

Category	Sample Population	Mean	Median	Standard Deviation	Normality (%)
Malay	136				
Chinese	45				
Indian	32				
East Malaysian	21				
Others	43				
Total	277	55.4	43	3.34	93.3
Ministry	4				
Health Department	41				
Hospital	139				
Clinic	17				
Health District Office	69				
Health Institution	7				
Total	277	46.2	29	2.78	94.4

Source: Calculated based on the cleaned responses

Regression

In this study, a regression model is used to analyse the impact of leadership characteristics and team diversity on public sector innovation. The model estimates how the position or grade of the team leader, the ethnic difference between the team leader and the majority of the team, and the presence of various ethnicities within the team contribute to innovation outcomes. In the regression model, the dependent variable is INOIMP, which represents the impact of public sector innovation. This is the outcome the study seeks to explain or predict. The independent variables, which are factors believed to influence this outcome, include GRADETL, ETHNICTL, and DIVERSE. GRADETL refers to the position or grade level of the team leader, capturing how seniority or leadership rank may affect innovation. ETHNICTL indicates whether the ethnicity of the team leader differs from that of the majority of team members, measuring the effect of ethnic difference in leadership. DIVERSE captures whether the innovation team consists of members from more than one ethnicity, reflecting the overall ethnic diversity of the team. These three independent variables are used to assess their respective contributions to variations in public sector innovation.

The estimated regression model is:

$$\text{INOIMP} = 10.635 + 0.073\text{GRADETL} + 1.711\text{ETHNICTL} + 3.654\text{DIVERSE}^{**}$$

Adjusted R-Square = 0.0414

F-value = 4.973*

Note: * significant at 1%, ** significant at 5%

where:

- INOIMP: Public sector innovation (dependent variable)
- GRADETL: Position or grade of the team leader (independent variable)
- ETHNICTL: Whether the team leader's ethnicity differs from the majority of team members (independent variable)
- DIVERSE: Presence of more than one ethnicity in the innovation team (independent variable)

Looking at individual predictors, the regression coefficients shed light on the specific impact of each variable. The intercept ($B = 10.635$, $p < .001$) is significant, suggesting that when all predictors are set to zero, the baseline level of public sector innovation is around 10.635.

The variable GRADETL, which captures the rank or grade level of the team leader, has a coefficient of 0.073 and a high p-value of 0.880, indicating no statistical significance. This implies that the leader's formal rank does not significantly influence the level of innovation, which may challenge conventional views that seniority or hierarchical position drives innovation in public organizations.

In contrast, ETHNICTL representing whether the team leader belongs to a different ethnic group from the majority of team members has a statistically significant coefficient ($B = 1.711$, $p = .023$). The positive value suggests that such ethnic difference is associated with higher levels of innovation. One possible interpretation is that a team leader who belongs to a different ethnic group from the majority of team members introduces broader perspectives, which can lead to more inclusive dialogue and creative problem-solving within teams.

The variable DIVERSE, representing the presence of more than one ethnicity in the innovation team has a coefficient of 3.654 and a p-value of 0.002, and it emerges as the most influential predictor of innovation. This variable indicates whether a team includes members from more than one ethnic group. Its strong statistical significance and positive coefficient suggest that ethnically diverse teams are substantially more innovative. This aligns with existing research that highlights the advantages of diversity in teams, including enhanced creativity, better decision-making, and improved innovation through a wider range of perspectives and experiences.

In summary, the findings from the regression analysis provide an insightful picture that the rank or grade level of the team leader (GRADETL) does not significantly affect public sector innovation, while both team-level ethnic diversity (DIVERSE) and team leader's ethnic difference (ETHNICTL) positively influence innovation. The results indicate that higher-ranking team leaders were not significant in enabling innovation, while teams led by individuals from a different ethnic background than most members tend to be more innovative. Furthermore, teams with greater ethnic diversity show a stronger positive effect on innovation, underscoring the significance of inclusive and diverse team compositions in enabling public sector innovation. Although, the model's overall explanatory power is modest, the statistically significant results highlight the critical role of ethnic diversity in fostering innovation in public sector settings.

To complement the quantitative findings of the regression analysis, a series of in-depth interviews were conducted with key informants across various levels of the Malaysian public healthcare system, including representatives from the Ministry of Health, State Health Departments, district health offices, hospitals, clinics, and national health institutions. These interviews aimed to provide contextual insights into how leadership characteristics and ethnic diversity influence innovation practices on the ground. The perspectives shared by innovation team leaders not only reinforce the statistical evidence particularly the significance of ethnic diversity (DIVERSE) and team leader ethnic difference (ETHNICTL) in driving innovation but also illuminate the lived realities beyond statistics. Through their narratives, the key informants offered rich, experience-based reflections that substantiate and deepen our understanding of the dynamics captured in the regression model.

Qualitative Data: Key Informant Interviews

Data from the 10 Key Informants were coded based on the themes that emerged from the interview as shown in Table 4 below:

Table 4: Thematic Coding of Key Informant Interviews

Theme	Key Informant(s)	Thematic Insights
GRADETL (Position/grade of the team leader)	KI1, KI2, KI4, KI7, KI8, KI9, KI10	<p><i>Innovation is not determined by the leader's grade or seniority, junior officers often introduce fresh, creative ideas, especially during crises.</i> (KI1, KI10)</p> <p><i>Senior leaders who step back and allow input from diverse members enable stronger outcomes.</i> (KI4, KI7, KI9)</p> <p><i>Leadership rank may help navigate administrative processes, but openness matters more than hierarchy for driving innovation.</i> (KI2, KI7, KI8)</p>
ETHNICTL (Leader's ethnicity differs from team majority)	KI4, KI6, KI9	<p><i>Leaders who are ethnically different from the majority create more inclusive and productive dialogues, even if initially uncomfortable.</i> (KI4, KI9)</p> <p><i>These differences encourage clarity, listening, and explanation across perspectives, resulting in smarter program rollouts.</i> (KI4, KI6, KI9)</p> <p><i>Leaders in minority ethnic positions recognise that innovation stems from cultivating divergent thinking rather than asserting authority.</i> (KI9)</p>
DIVERSE (Team includes more than one ethnicity)	KI1, KI2, KI3, KI4, KI5, KI6, KI7, KI8, KI9, KI10	<p><i>Ethnically diverse teams consistently outperform homogeneous groups by providing multiple perspectives and fostering creative friction.</i> (KI2, KI3, KI5, KI7, KI8)</p> <p><i>Diverse teams generate culturally sensitive solutions, improving outreach, communication, and acceptance among communities.</i> (KI1, KI2, KI4, KI5, KI10)</p> <p><i>Innovations such as digital outreach, telemedicine, adolescent health education, and integrative health programs.</i> (KI1, KI3, KI4, KI5, KI6, KI7, KI10)</p> <p><i>Diversity enriches team discussions, expands project scope, and ensures cultural resonance.</i> (KI6, KI8, KI9)</p>

Source: Coded based on themes by the researcher

The findings from the ten Key Informant (KI) interviews as shown in Table 4 highlights four broad themes, which are grade/rank of the team leader (GRADETL), ethnicity of the team leader (ETHNICTL) and diverse team members (DIVERSE). The findings are elaborated in Table 5 as below:

Table 5: Key Informant Profiles and Thematic Alignment

KI.	DIVERSE	ETHNICTL	GRADETL
KI1	Yes	–	No
KI2	Yes	–	No
KI3	Yes	–	-
KI4	Yes	Yes	No
KI5	Yes	–	–
KI6	Yes	Yes	–
KI7	Yes	–	No
KI8	Yes	–	No
KI9	Yes	Yes	No
KI10	Yes	–	No

- DIVERSE: ethnically diverse innovation team members
- ETHNICTL: ethnically diverse team leader
- GRADETL: grade or rank of team leader
- KI: key informant
- Yes = explicitly supports the theme
- No = does not support

GRADETL – grade or rank of team leader

Based on the key informant interviews, a strong consensus emerged that the grade or position of a leader is **not** a decisive factor in driving innovation within public healthcare facilities. Seven out of ten informants emphasized that successful innovation is not related to the high rank and grade of the team leader but most of the key informants said that innovation often stems from the ideas and contributions of junior officers, who bring fresh perspectives and creativity, particularly during crises. This view aligns closely with the quantitative findings of the study, which also highlighted that openness to diverse input and collaborative approaches outweigh rank of team leader in enabling innovation. Informant KI1 highlighted grade or rank is not important in-handling crisis:

"In my experience, innovation doesn't necessarily stem from someone being high up in the hierarchy. We've seen junior officers bring fresh, creative ideas during the COVID-19 crisis. What really makes a difference is when the team includes people from different ethnic backgrounds. We look at problems from multiple angles whereby our successful digital outreach programs actually came from an ethnically mixed team that debated everything from language accessibility to cultural sensitivities."

*KI1, Malay ethnic,
Deputy Director, Public Health Development Division, MOH.*

Another key informant, KI2 stated that holding a senior position in the public sector hierarchy may not necessarily drive innovation:

"My team has always been ethnically diverse, and I think that's a key driver of our success. There are things I wouldn't have thought of as a leader.... language nuances or community-specific health behaviours but my team members pick them up instantly. I might hold a senior title, but it's the mix of perspectives that drives real innovation. One of our district-level health apps wouldn't have reached the Orang Asli community without these insights."

*KI2, Indian ethnic,
Head of Strategic Planning, Selangor State Health Department*

In addition, KI4 added that team composition mattered more than the grade of the team leader to produce innovation outcomes:

"As a senior leader, I initially thought my experience would be the main driver of innovation. But over time, I realised it's not just the grade but it's the team composition. When I led a team where I was the only Bumiputera member, the dialogues were different, sometimes uncomfortable, but always productive. That ethnic difference encouraged everyone to explain things more clearly, listen more, and the result was a smarter telemedicine rollout."

*KI4, Chinese ethnic
Director, Queen Elizabeth Hospital, Sabah,*

ETHNICTL - ethnically diverse team leader

Three out of ten key informants (KI4, KI6, KI9) highlighted that leader's whose ethnicity differs from the majority of the team members can actively drive innovation within organisations. They explained that such leaders often facilitate more inclusive and productive dialogue by encouraging clarity, attentive listening, and cross-perspective explanation, even if initial interactions feel uncomfortable. This finding aligns with quantitative evidence that ethnically diverse leadership introduces broader perspectives, fostering inclusivity and creative problem-solving. However, it is worth noting that this view was shared by less than half of the key informants, suggesting that while some see strong potential in ethnically diverse leaders as a driver of innovation, others may not perceive it as a decisive factor in leadership effectiveness. Informant KI4 who rejects the fact that grade of team leader has any effect on innovation outcomes supported that ethnically diverse team leader creates more inclusive and productive dialogues, even if initially uncomfortable:

"As a senior leader, I initially thought my experience would be the main driver of innovation. But over time, I realised it's not just the grade but it's the team composition. When I led a team where I was the only Bumiputera member, the dialogues were different, sometimes uncomfortable, but always productive. That ethnic difference encouraged everyone to explain things more clearly, listen more, and the result was a smarter telemedicine rollout."

*KI4, Chinese ethnic,
Director, Queen Elizabeth Hospital, Sabah*

Another key informant, KI6 highlighted that team leaders who are ethnically different from the majority create more inclusive and productive dialogues:

"Our institute emphasises data-driven innovation, but the ideas that gain traction are often the ones coming from cross-cultural teams. When I led a homogenous team with similar ethnicity, our focus was narrow. Once we added ethnic variety including a female Indigenous researcher whereby the project scope widened dramatically. Innovation is not just about tools; it's about perspectives. The regression finding aligns with what we see here daily."

*KI6, Indian ethnic,
Head, Health Systems Research, Institute for Health Systems Research (IHSR)*

Similar view was shared by informant KI9 who shared her experience as the only Malay leading an ethnically diverse team which she said enriched cultural experiences and encouraged innovation:

"As a research institute, we are expected to push boundaries. What I've found is that when a team is diverse ethnically and professionally, it produces richer hypotheses and more community-relevant interventions. I once led a project team where I was the only Malay member. It made me realise that leadership isn't about control but about cultivating space for divergent thinking. That project, which integrated traditional and modern health practices, became one of our flagship models for community care."

*KI9, Malay ethnic,
Director, National Institute of Health (NIH), Setia Alam*

DIVERSE - ethnically diverse innovation team members

All ten key informants unanimously underscored that ethnically diverse teams are a powerful driver of innovation, not only because they bring together multiple perspectives, but also because they generate the type of constructive debate and "creative friction" that pushes ideas further. They emphasized that diversity is not limited to demographic representation, but extends into the richness of viewpoints, lived experiences, and cultural insights that directly shape the quality of team discussions and decision-making. By integrating these varied perspectives, teams were able to identify blind spots, anticipate community needs more accurately, and ensure that interventions resonated with the cultural contexts of target groups. This aligns closely with the quantitative findings presented earlier in the study, which demonstrated that diverse leadership and teams significantly broaden the pool of ideas, foster inclusive dialogue, and improve problem-solving effectiveness. Key informant, KI3 stressed the importance diverse innovation team members for integrative health program:

"I noticed that when I led a team composed mostly of similar backgrounds, our ideas tended to align too easily. But when we restructured the team with more ethnic representation, suddenly we had rich discussions, creative friction, and better ideas. I'm Malay, and some of my Chinese and Indian team members challenged how we looked at traditional medicine. That led to a successful integrative health program."

*KI3, Malay ethnic,
Chief Medical Officer, Hulu Langat Health District Office*

Another key informant, KI5 felt that ethnically diverse groups bring-in more cultural insights which is an important driver to innovation:

"We recently piloted a program for adolescent reproductive health education, and the most effective design came from a team where no two members were from the same ethnicity. Each person brought cultural insights that we used to shape the modules. Interestingly, the innovation wasn't mine to begin with as it came from a junior officer of a different ethnicity who felt empowered in that diverse environment."

*KI5, Malay ethnic,
Senior Family Medicine Specialist, Klinik Kesihatan Batu Pahat, Johor*

In addition, informant KI7 strongly supports the view that diverse team members ensure innovation product which is more user-friendly for a wider range of patients:

"Leadership rank may help in pushing through administrative red tape, but it doesn't create innovation. In fact, I've learned to step back. The most innovative project we ran which is an AI-driven triage tool came from an Indian team member paired with a Bumiputera IT staffer. Their ethnic and professional differences actually made the product more user-friendly for a wider range of patients."

*KI7, Chinese ethnic,
Deputy Director, Hospital Sultanah Aminah, Johor Bahru*

Moreover, informant KI8 who is a Head Nurse expressed the need for nurses from diverse ethnic backgrounds for innovations that caters for community interests:

"When I lead teams with people of different backgrounds, especially younger nurses from various ethnicities, the conversations get deeper. They bring up things I wouldn't think of, like how some communities view vaccinations or what language to use in health campaigns. My grade doesn't matter as much as making sure everyone feels heard. The ideas that work best are often born in those shared dialogues."

*KI8, Malay ethnic,
Head Nurse, Klinik Kesihatan Kg. Gajah, Perak*

Key informant, KI9 who agreed on diverse leadership to promote innovation also supported the importance of diverse team members that contribute to richer hypotheses and more community-relevant interventions:

"As a research institute, we are expected to push boundaries. What I've found is that when a team is diverse ethnically and professionally, it produces richer hypotheses and more community-relevant interventions. I once led a project team where I was the only Malay member. It made me realise that leadership isn't about control but about cultivating space for divergent thinking. That project, which integrated traditional and modern health practices, became one of our flagship models for community care."

*KI9, Malay ethnic,
Director, National Institute of Health (NIH), Setia Alam*

Another junior innovation team leader KI10, expressed that ethnically diverse team members brought different concerns language, trust, local customs that assist to drive innovation:

"I'm relatively junior compared to others, but I've been fortunate to lead a few innovation pilots in rural Negeri Sembilan. One common factor in our successful initiatives is team diversity. For example, we had a Chinese, Malay, and Temuan (Orang Asli) staff in a telehealth program for remote villages. Each brought different concerns language, trust, local customs. The innovation wasn't mine it was collective. Leadership rank didn't matter as much as openness to different worldviews."

*KI10, Chinese ethnic,
District Medical Officer, Kuala Pilah District Health Office*

The consolidated summary Table 7 presents insights from ten key informants across various levels of Malaysia's public healthcare system, highlighting how ethnic diversity and leadership characteristics influence innovation outcomes. A clear pattern emerges showing that ethnically diverse teams (DIVERSE) consistently contribute to more innovative practices, as reflected in all ten informants acknowledging its positive impact. Several informants also emphasised the value of team leader ethnic differences (ETHNICTL), noting that such diversity at the leadership level fosters broader dialogue and more inclusive problem-solving. Interestingly, leadership grade (GRADETL) was frequently seen as irrelevant to innovation, with many informants asserting that junior or frontline team members often drive successful innovation initiatives. These findings reinforce the results from regression analysis, validating the fact that team composition especially in terms of ethnic diversity plays a more crucial role in fostering innovation than formal rank or hierarchical status within the public healthcare system.

DISCUSSION

Both qualitative and quantitative results indicate a significant association between ethnic diversity and the level of innovation at Malaysian public healthcare facilities. This suggests that ethnic diversity plays an important role in shaping the level of innovation within these facilities. The findings underscore the importance of considering ethnic diversity in healthcare settings to enhance innovation and address potential disparities in service delivery.

Diversity and inclusion have been discussed in many fields for a long time, but their relevance to healthcare has only recently received significant attention. Ensuring that healthcare teams mirror the broad range of backgrounds in our communities' encompassing factors such as ethnicity, gender, immigration status, physical abilities, and socioeconomic backgrounds is vital for delivering top-quality care to all patients (Stanford, 2020).

The quantitative analysis provides a nuanced understanding of how team composition influences innovation within Malaysia's public healthcare system. The regression results reveal that the rank or grade level of a team leader (GRADETL) does not exert a significant effect on public sector innovation. In contrast, both team-level ethnic diversity (DIVERSE) and the ethnic dissimilarity between team leaders and their members (ETHNICTL) display positive and statistically significant relationships with innovation outcomes. These findings suggest that hierarchical seniority alone does not determine a team's capacity for innovation; rather, diversity within teams and leadership differences foster more dynamic and creative environments. Teams led by individuals of differing ethnic backgrounds tend to be more innovative, as are those composed of members from a variety of ethnic groups. Although the model's explanatory power remains moderate, the significance of these variables reinforces the pivotal role of inclusivity and ethnic heterogeneity in driving innovation across public healthcare institutions.

The qualitative findings from the key informant data reveals that ethnic diversity is crucial in determining innovation patterns in Malaysian healthcare facilities. Ethnic diversity can bring new ideas and perspectives to the table, but it must be managed effectively to prevent conflicts. Healthcare organizations must promote ethnic diversity to promote innovation and remain competitive in an ever-changing landscape. Ethnic diversity has been recognised as an important factor in promoting innovation in healthcare facilities. This supports the literature by Jones et al., (2020) that suggests ethnic diversity can contribute to innovation through knowledge sharing, effective communication, and a wider range of perspectives that can lead to creative problem-solving. However, the relationship between diversity and innovation is complex and may be influenced by various contextual factors such as communication and conflict management.

This observation aligns with the findings of Al-Monawer (2024), who analysed the relationship between workplace diversity and innovation, concluding that diversity significantly enhances organizational performance. Similarly, Lorenzo et al., (2017) emphasised that diversity introduces varied perspectives, driving creative problem-solving and the generation of novel ideas.

The discussion also addresses the role of team leader ethnic differences (ETHNICTL) in fostering broader dialogue and inclusivity. This perspective is supported by Chatman and Spataro (2005), who demonstrated that demographic differences influence individuals' responses to organisational culture, with diverse leadership prompting more deliberate communication strategies and inclusive problem-solving approaches. Additionally, Harrison et al., (2019) highlighted the role of cultural competence in enhancing engagement among ethnically diverse stakeholders, reinforcing the notion that ethnic diversity within leadership structures facilitates collective creativity and collaboration.

Regarding the perceived irrelevance of leadership grade (GRADETL) in driving innovation, Shand et al., (2021) observed that frontline staff often originate transformative ideas in healthcare delivery systems, challenging traditional hierarchical paradigms. Mulgan (2007) also emphasised the importance of tapping into the creativity of those closest to service delivery. These insights align with contemporary models of public sector innovation that prioritise agility, inclusivity, and bottom-up idea generation, as discussed by Bloch and Bugge (2013) and Omachonu and Einspruch (2010).

The discussion further integrates the concept of intersectionality, as introduced by Crenshaw (1989), to explain how multiple identities shape team dynamics and leadership effectiveness. Daya (2014) highlighted that inclusive workplace environments in emerging markets not only improve equity but also drive better business and innovation outcomes. This suggests that fostering intersectional inclusivity within public sector teams enhances collaboration and innovation in complex systems.

Finally, the discussion underscores the need for policy and structural reforms to institutionalize diversity and inclusivity within public sector innovation frameworks. Bovaird and Löffler (2003) emphasised that quality management in public institutions should encompass team composition and cultural responsiveness as key performance indicators. Koch and Hauknes (2005) argued that innovation in the public sector must be supported by structural enablers and cultural shifts to empower diverse voices in leading and implementing change. In the Malaysian context, such reforms could include targeted recruitment policies, inclusive leadership training, and cross-cultural competency programs to harness the innovation potential of a multi-ethnic workforce.

In addition to highlighting the influence of ethnic diversity on innovation, this study provides critical insights into the broader structural and organizational dimensions that shape innovation outcomes in Malaysia's public healthcare system. One such dimension is the decentralisation of innovation processes, which allows for greater autonomy at the team level. This is consistent with findings by Schubert and Tavassoli (2020), who argue that educational

and demographic diversity in top and middle management enhances innovation only when organisational structures permit flexibility and decentralised decision-making. In the Malaysian context, informants noted that when team leaders embraced ethnic diversity and allowed for autonomous initiative-taking among junior members, innovation flourished. This suggests that fostering an enabling environment enables diverse teams to be formed and empowered which is essential for converting diversity into practical, innovative outcomes.

Moreover, the findings reinforce existing empirical research showing that diversity does not merely support incremental improvements but also drives radical innovation. Østergaard et al., (2011) found that employee diversity whether in terms of gender, ethnicity, or educational background positively affects innovation performance across sectors. Informants from Malaysia's healthcare sector noted that many breakthrough ideas, such as culturally adapted health education tools and multilingual service platforms, emerged from ethnically mixed teams that were given room to experiment and collaborate without rigid hierarchical constraints. These examples validate the notion that diverse teams are better equipped to challenge status quo thinking and to co-create novel solutions tailored to pluralistic societies.

It is also essential to view these findings through the lens of long-term strategic value rather than short-term administrative efficiency. Garcia Martinez et al., (2017) emphasised that diversity should be regarded not only as a human resource strategy but as a core component of innovation management. Their research, focused on R&D-intensive organisations, highlighted how diverse teams outperform homogeneous ones when organisations commit to long-term investment in inclusion and cross-cultural collaboration. This insight holds particular relevance for the Malaysian public sector, where traditional bureaucracy may undervalue the strategic benefits of diversity unless institutionalised through training, recruitment, and evaluation mechanisms. Embedding diversity and inclusion into the core innovation strategy, therefore, requires a paradigm shift, one that aligns with the broader goals of health equity, service responsiveness, and national cohesion.

Finally, fostering a culture of innovation rooted in diversity also demands a re-evaluation of leadership styles and expectations. Stahl and Maznevski (2021) conducted a retrospective analysis of multicultural workgroups and concluded that inclusive leadership not just represent diversity but it is key to unlocking the potential of diverse teams. In the interviews, several informants shared that, leaders who practiced humility, cultural empathy, and open communication were more likely to inspire innovation, even when they lacked formal authority or senior rank. This finding mirrors Yusuf's (2007) argument that creativity is not inherently hierarchical but thrives in environments that reward curiosity and diversity of thought. As Malaysia continues to reform its public service to meet evolving societal needs, cultivating such inclusive and dynamic leadership may be pivotal in sustaining innovation across all levels of government.

CONCLUSION

Ethnic diversity within public healthcare facilities emerges as a crucial catalyst for innovation, as evidenced by both the statistical analysis and accounts shared during the key informant interviews. In particular, several interviewees described scenarios in which teams composed of multiple ethnicities were more adept at identifying community needs and designing culturally tailored interventions. This observation aligns with findings in broader organisational research, where diversity is often associated with heightened creativity and problem-solving capacity (Anderson & West, 1998). When staff from varied cultural and linguistic backgrounds collaboratively explore issues, they tend to challenge assumptions more robustly, ultimately unveiling innovative solutions that benefit both healthcare providers and patients.

The value of intercultural competence in enhancing the effectiveness of ethnically diverse teams is strongly supported by empirical research. Lloyd and Hartel (2010) emphasise that intercultural competencies such as cognitive complexity, cultural empathy, and conflict management skills are critical to building trust and satisfaction in multicultural work environments, suggesting that individual abilities play a crucial role in team cohesion and performance. Complementing this, Balakrishnan et al., (2021) argue that intercultural communication competence defined by the interplay of attitudes, knowledge, and behavioural skills significantly contributes to both the well-being and productivity of multicultural teams. Together, these findings underline the necessity of targeted capacity-building and leadership strategies that cultivate such competencies. Without intentional investment in these areas, the advantages of team diversity may be undermined by interpersonal friction and miscommunication, preventing the full realisation of innovative potential.

The theoretical framework underpinning this study provides critical conceptual grounding for these findings. The study situates ethnic diversity within a system of variables that influence healthcare innovation outcomes, including organisational processes, cultural factors, and leadership practices. Crenshaw's (1989) intersectionality framework further enriches this understanding by revealing how overlapping social identities such as ethnicity, socio-economic status, and professional hierarchy interact to shape innovation experiences within public healthcare teams. Additionally, Mulgan's (2007) typology of public sector innovation enables a structured interpretation of the different forms of innovation observed service, administrative, policy, and systemic while the adaptation of measurement methodologies from the Oslo Manual and MEPIN project (Bloch & Bugge, 2013) offers a methodological contribution by contextualising global innovation metrics to the Malaysian public healthcare setting. Together, these frameworks not only guided the analytical lens of this research but also extend the theoretical discourse by demonstrating how diversity and intersectionality can serve as active mechanisms driving healthcare innovation in a multicultural society.

Based on both the quantitative analysis from questionnaire survey and qualitative insights drawn from key informant interviews, the findings strongly affirm that ethnically diverse teams are a significant driver of innovation across various Malaysian public healthcare facilities. The data consistently points to a clear trend which is, innovation flourishes most effectively when teams are composed of individuals from different ethnic backgrounds. These teams bring a richer variety of perspectives, experiences, and problem-solving approaches, which enables them to address complex healthcare challenges with greater creativity and adaptability. This diversity in thought processes and cultural insights often translates into more patient-centred, contextually appropriate, and socially sensitive healthcare innovations. Thus, the evidence underscores that ethnic diversity is not merely a demographic characteristic but a potent asset that meaningfully enhances innovation outcomes in Malaysia's public healthcare ecosystem.

Interestingly, while the presence of ethnically different leaders in innovation teams does show a moderate positive correlation with innovation output, the data suggests that it is the composition of the team itself rather than the ethnicity or seniority of the leader that has the most substantial impact. Diverse teams, regardless of who leads them, consistently outperform more homogenous groups in generating novel ideas, refining implementation strategies, and sustaining long-term improvements. This indicates that the collective dynamic of an ethnically plural team contributes more significantly to the innovation process than the attributes of any single leader. It suggests that innovation in the public healthcare context is less about top-down direction and more about lateral collaboration, where inclusive team structures and mutual respect among team members enable the sharing and integration of diverse knowledge domains.

Furthermore, the analysis reveals that the formal position or rank of the team leader whether high-ranking administrators or mid-level managers, does not have a statistically significant impact on the innovation outcomes observed in public healthcare facilities. This challenges conventional assumptions about the role of hierarchical leadership in driving innovation and points instead to a more distributed, egalitarian model of innovation management. In these settings, the enabling factors are more about how leadership practices encourage collaboration, empower diverse voices, and cultivate an environment of psychological safety. Hence, it is imperative for public healthcare institutions to shift their focus toward fostering inclusive team cultures, investing in structured diversity training, and adopting leadership models that prioritise facilitation over control. These strategies are crucial to fully leverage the transformative potential of ethnic diversity in delivering sustained and impactful healthcare innovations.

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