

**Impact of Health Information Management, Mentorship and Healthcare Delivery in Rivers State, Nigeria**

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**Abstract**

This study examined the effects of health information management and mentorship on healthcare delivery in Rivers State, Nigeria. This study employed a correlational research design. Multistage sampling technique was used to select a sample size of 400 healthcare workers from the population of 4860 healthcare workers in public primary healthcare facilities. Data were collected through a structured questionnaire and analyzed using multiple regression analysis at 0.05 level of significance. The results showed that health information management ( $\beta = 0.642$ ,  $p < 0.05$ ) and mentorship ( $\beta = 0.598$ ,  $p < 0.05$ ) were impactful on healthcare delivery respectively. Moreover, health information management and mentorship collectively predicted healthcare delivery alone ( $R^2 = 0.534$ ,  $p < 0.05$ ) meaning both variables accounted for 53.4% of the variability in healthcare delivery. The study found that the delivery of healthcare depends on efficient health information systems and strong mentorship structures to strengthen workforce capacity. Policymakers were advised to adopt a holistic approach that can integrate and strengthen both the digital health systems and professional mentoring to optimize service delivery outputs.

**Keywords:** health information management, mentorship, healthcare delivery, primary healthcare, Rivers State, Nigeria

**INTRODUCTION**

Healthcare delivery is a major driver of the national development agenda and continues to remain an elusive quest for both low- and middle-income countries as systemic inefficiencies have been shown to impede service effectiveness and population health outcomes. Healthcare system in Nigeria is plagued by persistent weaknesses such as inadequate infrastructure, under-staffing, poor data stewardship processes and lack of digital health technology integration<sup>8 9</sup> that undermine the quality and availability of care (Federal Ministry of Health [FMoH], 2021; World Health Organization [WHO], 2022). In this regard, Rivers State in the Niger Delta region offers an interesting case study of simultaneous urbanisation and rural marginalisation with subsequent pressure on the health sector.

Health information management (HIM) has been a critical element in efforts to address the inefficiencies plaguing healthcare systems around the world by simplifying processes tied to collecting, storing, analyzing, and using data for informed decisions. Some effective HIM systems have been existing in the country replacing ineffective, incomplete or absent health information system. Nonetheless, the poor quality of data, under-utilization of health data, inadequate training and weak institutional support continue to undermine optimal performance of these systems in

many states including Rivers State (Aqil et al., 2019; Oleribe et al., 2019). Therefore, health information systems can be used more efficiently to enhance the quality of healthcare.

While traditional healthcare interventions, technological and system-level advances, have facilitated performance, there has been renewed focus on human resource development through mentorship as a strategy for improving performance. In the healthcare context, mentorship is defined as a formal developmental experience that provides additional support and attention to improve professional skills, confidence, competence and job performance. Mentorship likely fosters not only improved clinical practice, adherence to protocols, problems solving and job satisfaction of health personnel (Frei et al., 2019; Sambunjak et al., 2010). Mentorship programmes have been acknowledged as critical to fill knowledge gaps, build workforce capacity, and facilitate implementation of health policies and programs in low-resource settings such as Nigeria (Rowe et al., 2018).

This is especially important in the context of health: success. However, while strong information systems furnish the data needed to plan for and evaluate interventions, mentorship is what ensures that health care workers have the necessary skills and motivation to activate those data in clinical and administrative decision-making. Research from other settings indicates that well mentored and supported healthcare workers are more likely to practice data-driven decisioning, group level measurement and response compliance (Nutley & Reynolds, 2013; Wagenaar et al., 2017). However, little empirical evidence examined the combined effect of health information management and mentorship on healthcare delivery at sub-national levels such as Rivers State.

Also, some challenges associated with access to service and quality of care, responsiveness and efficiency in healthcare delivery prevail more at the primary healthcare level in Rivers State (RSHC, 2021). Poor health outcomes are borne out of a myriad of factors including irregular data reporting, mediocre utilisation of health information in making decisions and lack of professional support systems (National Primary Health Care Development Agency [NPHCDA], 2020). These gaps underscore the importance of taking an integrated approach that combines the use of technology with capacity development interventions to improve health systems.

While the health sector in Nigeria has undergone reforms, there remain formidable challenges to effective healthcare delivery notwithstanding improved funding across levels, particularly at the primary level, given that this is where most Nigerians seek care. These challenges surface in Rivers State as inconsistent service quality, poor clinical coordination, delay to care, poor patient management, and health outcomes. Digital health information systems like DHIS2 and NHLMIS have been introduced to enhance data management for evidence-based decision-making, but challenges of poor data quality, incomplete reporting, weak culture for utilizing the data generated and inadequate technical capacity at the healthcare worker level persist (Aqil et al., 2019; Nutley & Reynolds, 2013). Consequently, health information which ought to inform planning, monitoring and service-enhancement are not effectively harnessed leading to an overall weakening in the system of healthcare delivery.

As well as system related issues, the human resource part of health service delivery is an enduring issue. Healthcare workers in many facilities work with little professional support, limited supervision, and few opportunities for structured mentorship which are crucial components of skill development and performance improvement. Lack of appropriate mentorship framework results in poor clinical competence, adherence to standard treatment protocols and motivation among health personnel (Frei et al., 2019; Rowe et al., 2018). While health information management and mentorship have each been identified as important determinants of the performance of healthcare

delivery, there is little research into their joint influence, hence, this gap hampers the efforts by policymakers and health administrators in developing concurrent strategies to enhance data systems along with human capacity. Thus, the objective of this study is to investigate the effect of health information management and mentorship on healthcare delivery in Rivers State, Nigeria.

### **Research Questions**

The following research questions will guide the study:

1. Importance of health information management in healthcare delivery practice-effects?
2. Does mentorship have any effect on healthcare delivery in Rivers State, Nigeria?
3. What is the combined effect of mentorship and health information management on healthcare delivery in Rivers State, Nigeria?

### **Research Hypotheses**

Null Hypotheses The following null hypotheses will be tested at 0.05 level of significance:

**H<sub>01</sub>:** Health information management does have a significance influence on healthcare delivery in Rivers State, Nigeria

**H<sub>02</sub>:** There is no significant effect of mentorship on healthcare delivery in Rivers State, Nigeria.

**H<sub>03</sub>:** There is no joint influence of health information management and mentorship on healthcare delivery in Rivers State, Nigeria.

### **METHODOLOGY**

The approach to the study was a correlational nature of research design. The study was conducted in Rivers State, Nigeria which is located in the South-South geopolitical zone. Rivers State has a three-tier structure comprising of primary, secondary and tertiary health facilities both public and private. Service delivery is based on primary health care centres, especially in rural and semi-urban communities. All healthcare workers in public primary healthcare facilities in Rivers State made up the population of the study. The Rivers State Primary Health Care Management Board (2025) indicates that there are 4,860 health care workers across the 319 functional primary healthcare facilities in the state. This cohort consists of frontline health care service workers and data managers, including nurses, community health extension workers (CHEWs), health information officers and laboratory personnel.

Krejcie and Morgan (1970) sample size determination table was used to get the study's sample size for a total of 4,860 respondents which returns a minimum sample of 357. In order to account for possible non-response, the final sample size ends at 400 respondents. A multistage sampling approach was employed. Stratified sampling was used to group the healthcare facilities as per senatorial districts (Rivers East, Rivers West and Rivers South-East) at first. Secondly, we performed simple random sampling of the facilities from within each of these strata. Lastly, healthcare workers from all the selected facilities were sampled based on healthcare workers.

The data collection tool was a structured questionnaire on Health Information Management, Mentorship and Healthcare Delivery Questionnaire (HIMMHCDDQ). Based on the Cronbach's Alpha method, reliability of the instrument was identified. The corresponding reliability coefficients were 0.82 for health information management, 0.79 for mentorship and 0.85 for healthcare delivery, making the instrument viable in this study. Data collected were analysed using inferential statistics. Using multiple regression analysis at 0.05 level of significance to test the hypotheses. All analyses were performed using the Statistical Package for Social Sciences (SPSS; version 25).

## RESULTS

**H<sub>01</sub>:** Health information management has no significant impact on healthcare delivery in Rivers State, Nigeria.

**Table 1: Regression Analysis on the Impact of Health Information Management on Healthcare Delivery**

| Model                         | R                     | R Square | Adjusted R Square |                    | Std. Error |             |
|-------------------------------|-----------------------|----------|-------------------|--------------------|------------|-------------|
| 1                             | 0.642                 | 0.412    | 0.409             |                    | 0.523      |             |
| <b>ANOVA</b>                  | <b>Sum of Squares</b> |          | <b>df</b>         | <b>Mean Square</b> | <b>F</b>   | <b>Sig.</b> |
| Regression                    | 78.214                |          | 1                 | 78.214             | 285.613    | 0.000       |
| Residual                      | 111.785               |          | 382               | 0.293              |            |             |
| Total                         | 189.999               |          | 383               |                    |            |             |
| <b>Coefficients</b>           | <b>B</b>              |          | <b>Std. Error</b> | <b>Beta</b>        | <b>t</b>   | <b>Sig.</b> |
| (Constant)                    | 1.214                 |          | 0.143             |                    | 8.493      | 0.000       |
| Health Information Management | 0.587                 |          | 0.035             | 0.642              | 16.897     | 0.000       |

The result indicates health information management is plays a significant role in healthcare delivery ( $\beta = 0.642$ ,  $p < 0.05$ ). The  $R^2$  of 0.412 means that the variation in healthcare delivery is accounted for by health information management (41.2%). Based on the p-value that is smaller than 0.05, null hypothesis can be rejected. This suggests that adequate health information management greatly influences the provision of health care services in Rivers State.

**H<sub>02</sub>:** Mentorship has no significant effect on healthcare delivery in Rivers State, Nigeria.

**Table 2: Regression Analysis on the Effect of Mentorship on Healthcare Delivery**

| Model               | R                     | R Square | Adjusted R Square |                    | Std. Error |             |
|---------------------|-----------------------|----------|-------------------|--------------------|------------|-------------|
| 1                   | 0.598                 | 0.358    | 0.354             |                    | 0.561      |             |
| <b>ANOVA</b>        | <b>Sum of Squares</b> |          | <b>df</b>         | <b>Mean Square</b> | <b>F</b>   | <b>Sig.</b> |
| Regression          | 68.021                |          | 1                 | 68.021             | 216.432    | 0.000       |
| Residual            | 121.978               |          | 382               | 0.319              |            |             |
| Total               | 189.999               |          | 383               |                    |            |             |
| <b>Coefficients</b> | <b>B</b>              |          | <b>Std. Error</b> | <b>Beta</b>        | <b>t</b>   | <b>Sig.</b> |
| (Constant)          | 1.387                 |          | 0.151             |                    | 9.187      | 0.000       |
| Mentorship          | 0.521                 |          | 0.035             | 0.598              | 14.711     | 0.000       |

Mentorship has a statistically significant effect on healthcare delivery ( $\beta = 0.598$ ,  $p < 0.05$ ). The  $R^2$  value of 0.358 shows that mentorship explains 35.8% of the variation in healthcare delivery. The null hypothesis is therefore rejected. This suggests that effective mentorship contributes significantly to improved healthcare delivery.

**H<sub>03</sub>:** Health information management and mentorship have no significant joint influence on healthcare delivery in Rivers State, Nigeria.

**Table 3: Multiple Regression Analysis on the Joint Influence of Health Information Management and Mentorship on Healthcare Delivery**

| Model                         | R                     | R Square | Adjusted R Square |                    | Std. Error  |             |
|-------------------------------|-----------------------|----------|-------------------|--------------------|-------------|-------------|
| 1                             | 0.731                 | 0.534    | 0.529             |                    | 0.472       |             |
| <b>ANOVA</b>                  | <b>Sum of Squares</b> |          | <b>df</b>         | <b>Mean Square</b> | <b>F</b>    | <b>Sig.</b> |
| Regression                    | 101.492               |          | 2                 | 50.746             | 227.845     | 0.000       |
| Residual                      | 88.507                |          | 381               | 0.232              |             |             |
| Total                         | 189.999               |          | 383               |                    |             |             |
| <b>Coefficients</b>           |                       |          | <b>B</b>          | <b>Std. Error</b>  | <b>Beta</b> | <b>t</b>    |
| (Constant)                    |                       |          | 0.984             | 0.137              |             | 7.183       |
| Health Information Management |                       |          | 0.401             | 0.042              | 0.439       | 9.548       |
| Mentorship                    |                       |          | 0.346             | 0.039              | 0.372       | 8.872       |

The outcome shows health information management and mentorship have significant positive effects on healthcare delivery as a joint effect with adjust  $R^2 = 0.534$ ,  $p < 0.05$ . This indicates that the two variables in combination explain 53.4% of the total variability in healthcare delivery. All predictors were statistically significant with respect to health information management and mentorship in that order of influence. Result shows that the joint effect of these variables adds significantly to healthcare delivery outcome in Rivers State hence the null hypothesis is rejected.

## DISCUSSION OF FINDINGS

The results of the first hypothesis showed that health information management was a strong predictor of healthcare delivery in Rivers State ( $\beta = 0.642$ ,  $p < 0.05$ ,  $R^2 = 0.412$ ). This means that when combining the data, more than 41.2% of the variance in healthcare delivery has been explained by health information management. In short, the argument here is that, for instance, having good data to collect and effectively using that data can maximize service delivery outputs (better efficiency levels and planning ahead). This reflects what was found by Wagenaar et al. (2017) who found that regular use of routine health data enhanced the planning and accountability of services contributing to improved service outcomes. In the same way, Nutley and Reynolds (2013) argued that "Increasing data use is one of the strategies for encouraging evidence-based decision-making and improving health systems performance. In this context though, this result is not in agreement with Oleribe et al. (2019) have highlighted weak implementation and data use culture within many African health systems thwarting the potential of health information systems. This difference may be attributed to differences in context such as enhanced training, supervision and gradual integration of digital health into routine nursing practice in Rivers State.

The second result suggested that mentorship significantly predicted healthcare delivery ( $\beta = 0.598$ ,  $p < 0.05$ ,  $R^2 = 0.358$ ), meaning mentor was responsible for the differences on healthcare deliver by up to 35.8%. It indicates that healthcare workers are better able to provide quality services when they receive structured guidance and professional support. This result aligns with the finding of Deussom et al. (2022), by analysing how mentorship and supportive supervision influenced health worker performance and service deliverables in low- and middle-income countries; Along the same lines of work, Sambunjak et al. (2010) that mentorship improves clinical skill and decision-making for health care professionals. Rowe et al. The authors established that

interventions aimed at modifying provider practices, such as mentorship, are effective at improving the quality of healthcare delivery (2018). However, Frei et al. Though Seth et al. (2019) noted that mentorships do not seem to provide long-lasting improvements unless matched with additional structural supports from the larger organization.

This indicates that mentoring was more successful when integrated within a supportive organizational structure.

The third finding was of a significant effect of health information management and mentorship on healthcare delivery ( $R = 0.731$ ,  $R^2 = 0.534$ ,  $p < 0.05$ ) indicating that the model explains about 53.4% variation in healthcare delivery as a whole. In the final model, health information management ( $\beta = 0.439$ ,  $p < 0.05$ ) and mentorship ( $\beta = 0.372$ ,  $p < 0.05$ ) contributed marginally more than individually in the combined model from a beta perspective. This implies that each variable is complementary of the other and they both enhance the delivery of healthcare outcomes. This finding is compatible with the arguments of Nutley and Reynolds (2013) that data use in health systems is most powerful when health workers are trained, supervised and supported to make sense of information in relation to context. Similarly, Wagenaar et al. (2016), data-driven quality improvement efforts rely heavily on the talent and commitment of the people involved. This synergy in this study indicates that mentoring improves healthcare workers' performance of health information systems human resources, which leads to an improvement of service delivery system.

Overall, the results show that neither health information management nor mentorship by itself is enough for optimal healthcare delivery; their combined use gives a more powerful and relevant result. Health information management equips you with a data infrastructure for planning and evaluation, mentorship prepares the human resources to work optimally even with such systems. This suggests that health-system improvement initiatives in Rivers State should not be focused purely on investments or workforce training in isolation; strategies embedded within the whole-systems and human capital frameworks may yield greater benefits through concurrent strengthening of systems reengineering and human capacity for sustainable gains in healthcare delivery.

## **CONCLUSION**

The focus of this study was the influence of health information management and mentorship on healthcare delivery in Rivers State, Nigeria. Results: Results of the analysis indicated that health information management and mentorship have both individually positive effects on healthcare delivery. Currently, data availability and utilization improved due to health information management with further training being provided for the accuracy of the data while mentorship improved healthcare worker competency, confidence and performance. More interestingly, the study was able to demonstrate that the combined effect of all these variables had a greater impact on healthcare delivery than either factor alone.

Conclusion The results imply that healthcare is not simply dependent on the presence of aggregate frameworks or learning piloted workforces alone, however an effective coordination among computerized and authoritative change. Health information systems deliver data to support planning or decision-making, but mentorship pre-supposes that healthcare workers will be able to use such data effectively in practice. If either one of the components are weak, then overall system performance is compromised.

Thus, developing healthcare delivery in Rivers State needs both health information management systems and structured mentorship programs upgrading at the same time. The

integration of these sources is the key to accessing unbroken, efficient, responsive, and high-quality healthcare system services that correspond with the health needs of the population.

## RECOMMENDATIONS

1. Additional recommendations came from the Rivers State Ministry of Health and the Rivers State Primary Health Care Management Board, which suggested enhancing health information management systems by providing regular training for healthcare workers on data collection, reporting, and utilization while also upgrading infrastructure involving internet connectivity, digital tools and supportive supervision to encourage a strong culture of data use.
2. Healthcare institutions should implement systematic and ongoing mentorship programmes at the level of primary healthcare facilities where more experienced health professionals mentor, coach and provide performance support to junior staff to help develop appropriate clinical competencies along with better adherence to protocols and improved service quality.
3. Policymakers and health administrators should adopt an integrated approach to developing action plans that combine health information management and mentorship by linking data use with mentorship activities, designed such that trained healthcare workers are nurtured through effective linkage of capacity in using the systems with mentoring for effective use of data in decision making and service delivery.

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