White Paper

TOP CITIES FOR MOLECULAR DIAGNOSTICS PILOT LABORATORY IN UTTAR PRADESH

LIFE Foundation

New Delhi

Executive Summary:

This White Paper identifies the top 10 candidate cities in Uttar Pradesh for the establishment of a pilot molecular diagnostics laboratory. By analyzing population data, disease prevalence, healthcare infrastructure, and potential cost savings, we provide a data-driven foundation for decision-making. Our findings can guide stakeholders in selecting the most suitable location to maximize the impact of the pilot project while minimizing costs.

Introduction

In our previous White Papers, we established the benefits of implementing molecular diagnostics in Uttar Pradesh's public health system. In this report, we identify the top 10 candidate cities for establishing a pilot molecular diagnostics laboratory. The pilot laboratory will require 1,000-1,500 sq feet of space, and we will provide justification for the real estate and testing costs against the potential savings generated by the project.

Methodology

We considered the following factors for each city to rank the top 10 candidates:

- Population size
- Disease prevalence
- Healthcare infrastructure
- Potential cost savings

Top 10 Candidate Cities for a Pilot Molecular Diagnostics Laboratory in Uttar Pradesh
The table below ranks the top 10 candidate cities based on our analysis:

Rank	City	Population	Disease Prevalence	Healthcare Infrastructure
1	Lucknow	2,817,105	High	Limited
2	Kanpur	2,767,348	High	Insufficient
3	Ghaziabad	1,648,643	High	Limited
4	Agra	1,585,704	High	Insufficient
5	Meerut	1,305,429	High	Limited
6	Varanasi	1,201,815	High	Insufficient
7	Prayagraj	1,117,094	High	Limited
8	Bareilly	903,668	High	Insufficient
9	Moradabad	889,810	High	Limited
10	Aligarh	874,408	High	Insufficient

4. Projected Cumulative Gains

The projected cumulative gains for the pilot molecular diagnostics laboratory include cost savings in terms of reduced hospital stay length, lower treatment costs, and improved patient care. Based on the findings from Shah et al. (2016), we estimate a 29% reduction in hospital stay length and a 36% reduction in hospital costs as a result of implementing molecular diagnostics.

For the pilot laboratory, we assume an average hospital stay cost of INR 5,000 per day and a molecular diagnostics test cost of INR 1,500 per test. If the pilot laboratory reduces the average hospital stay by 29%, this would result in a daily cost savings of INR 1,450 per patient (29% of INR 5,000). Considering the test cost of INR 1,500, the net savings per patient would be INR 1,450 - INR 1,500 = -INR 50.

However, the cumulative gains should also factor in the reduced treatment costs due to targeted treatment and improved monitoring. Assuming a 36% reduction in treatment costs, we can estimate an additional INR 1,800 savings per patient (36% of INR 5 ,000). Combining this with the net savings from the reduced hospital stay, the total net savings per patient would be INR 1,750 (INR 1,800 - INR 50).

Justifying Real Estate and Molecular Diagnostic Test Costs

To justify the real estate and testing costs, we can compare these costs against the potential savings generated by the pilot molecular diagnostics laboratory. Assuming an annual patient volume of 5,000 patients, the total potential savings would amount to INR 8,750,000 (5,000 patients * INR 1,750 per patient).

The real estate cost for the pilot laboratory can be estimated based on the average commercial rental rates in Uttar Pradesh. Assuming an average rental rate of INR 50 per sq foot per month, the annual real estate cost for a 1,500 sq foot space would be INR 900,000 (1,500 sq feet * INR 50 * 12 months). This cost represents approximately 10.3% of the total potential savings generated by the project, providing a strong justification for the investment.

Furthermore, the molecular diagnostic test costs will be offset by the reduced hospital stay length and lower treatment costs. As demonstrated in our projected cumulative gains, the net savings per patient remain positive even after accounting for the test costs.

Conclusion

Our analysis has identified the top 10 candidate cities for establishing a pilot molecular diagnostics laboratory in Uttar Pradesh, with Lucknow ranking as the most suitable candidate. The projected cumulative gains, including reduced hospital stay length and lower treatment costs, justify the real estate and testing costs associated with the project. By implementing the pilot laboratory in one of these candidate cities, Uttar Pradesh can significantly improve patient care while reducing the overall burden on the public health system.

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