Internship Training

At

PwC India

Study / Project title

‘Factors for successful establishment of a hospital – a study in Indian context’

By

Name – Mr. Anindya Mukherjee

Enroll No. – PG/21/012

Under the guidance of

Dr. Punit Yadav

PGDM (Hospital & Health Management)

2021-2023

International Institute of Health Management Research New Delhi

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FEEDBACK FORM

Name of the student – Mr. Anindya Mukherjee

Name of the Organization in Which Dissertation Has Been Completed – PwC India

Area of Dissertation – Management Consulting

Objectives achieved – Anindya completed a deep dive assessment into the topic of considerations for setting up a new healthcare establishment (Meaning, Importance). The topic is considered important to enable healthcare accessibility in the country and reduce variability in the geographical hospital bed density in the country.

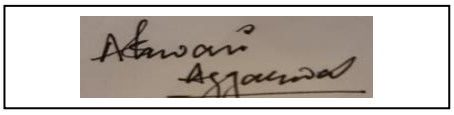
Deliverables – A detailed word document on the aforementioned areas, leveraging secondary literature evidence as published in peer reviewed indexed journal articles

Strengths – 1. Ability to collect evidence via secondary literature search.
2. Analytical aptitude to combine different data sets and present the information in a meaningful manner.
3. Think through the problem statements from multiple perspectives, and not only from a financial feasibility view.

Suggestions for Improvements – 1. Present the information collected in a unified manner.
2. Identify the definite learnings / takeaways from the report in form of an executive summary, in a crisp manner, which can be presented to senior management.

Suggestions for Institute (course curriculum, industry interaction, placement, alumni) – 1. Further expand the scope of comprehensive topics being covered in the institute.

2. Considering the information overload in today's digital age, some initiatives on developing a view point on a problem statement, imbibing conflicting opinions.



Signature of the Officer-in-Charge / Organization Mentor (Dissertation)

Date – 22 / 06 / 2023

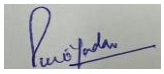
Place – Delhi

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Anindya Mukherjee** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **PwC India** from **23-01-2023** to **21-04-2023**.

The candidate has successfully carried out the study designed to him during internship training and his approach to the study has been sincere, scientific and analytical. The internship is in fulfillment of the course requirements.

I wish him all success in his future endeavors.



Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Mentor - Dr. Punit Yadav
Professor, IIHMR DELHI
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **"Factors for successful establishment of a hospital – a study in Indian context"** at **"PwC India"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood thatby this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

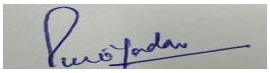
Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
Dr. Shiv.	
Dr. Anandi Ramachandran.	
Dr. Sumant Singh	

Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Anindya Mukherjee,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He is submitting this dissertation titled "**Factors for successful establishment of hospitals – a study in Indian context**" at "**PwC India**" in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.



Institute Mentor Name

Dr. Punit Yadav

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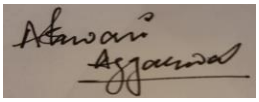
Professor

Organization

IIHMR DELHI



Organization Mentor Name

Dr. Ashwani Aggarwal

Designation

Director

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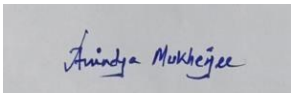
PwC India

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,

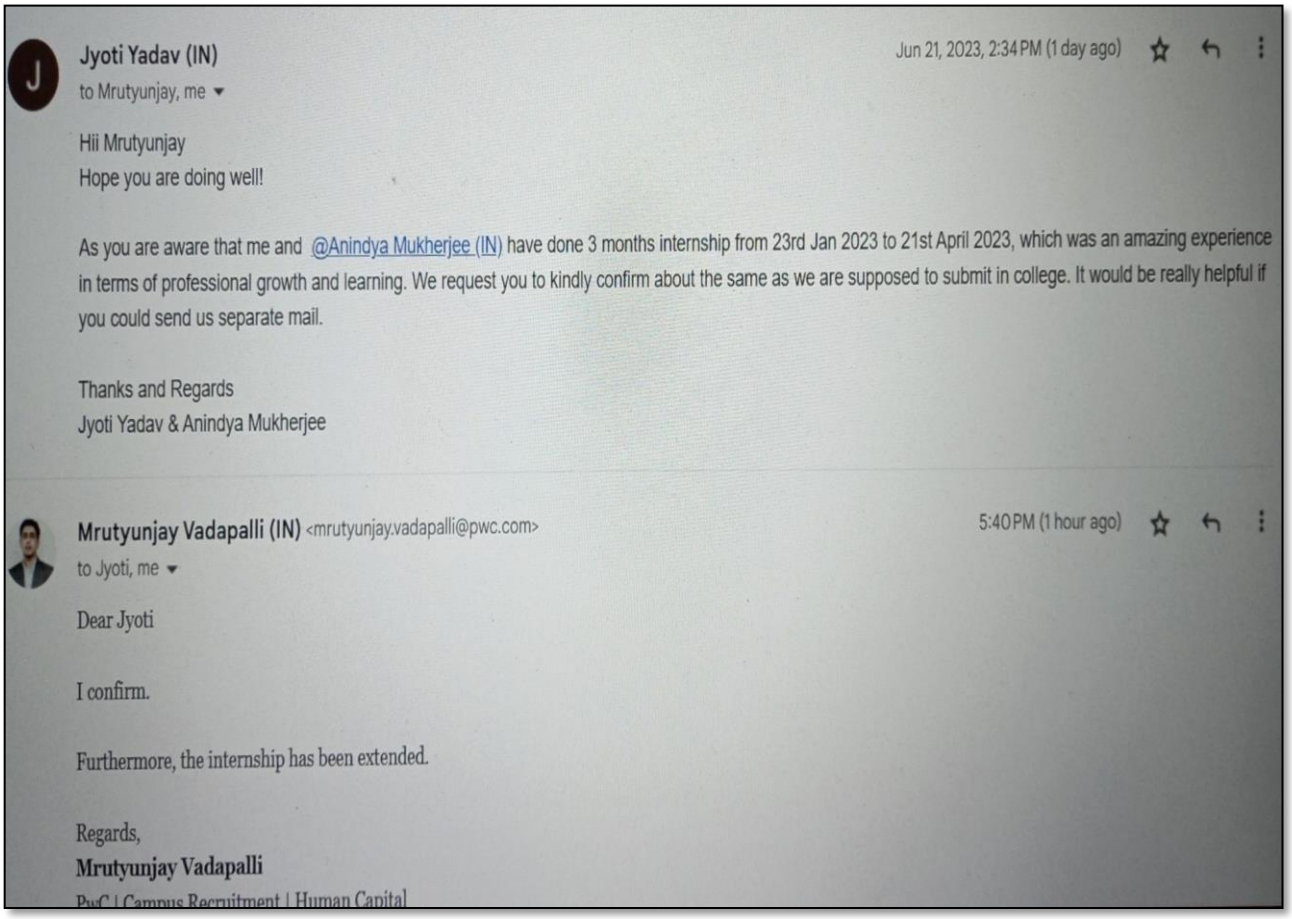
NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled '**Factors for successful establishment of a hospital – a study in Indian context'** and submitted by **Mr. Anindya Mukherjee** Enrollment No. **PG/21/012** under the supervision of **Dr. Punit Yadav** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **23-01-2023** to **21-04-2023** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



Signature



Jyoti Yadav (IN) Jun 21, 2023, 2:34 PM (1 day ago)

to Mrutyunjay, me

Hii Mrutyunjay
Hope you are doing well!

As you are aware that me and @Anindya Mukherjee (IN) have done 3 months internship from 23rd Jan 2023 to 21st April 2023, which was an amazing experience in terms of professional growth and learning. We request you to kindly confirm about the same as we are supposed to submit in college. It would be really helpful if you could send us separate mail.

Thanks and Regards
Jyoti Yadav & Anindya Mukherjee

Mrutyunjay Vadapalli (IN) <mrutyunjay.vadapalli@pwc.com> 5:40 PM (1 hour ago)

to Jyoti, me

Dear Jyoti

I confirm.

Furthermore, the internship has been extended.

Regards,
Mrutyunjay Vadapalli
PwC | Campus Recruitment | Human Capital

Table of Content

Abstract

Purpose

The purpose of this study is to identify, and understand the important factors for successfully establishing a hospital. This study aims to integrate most of the important parameters which are to be considered before setting up a hospital.

Design/Methodology/Approach

For this particular study, A literature review of various journals, research studies have been done regarding setting up a hospital in a region. Consideration and understanding of the factors for setting up a new hospital in India was done via reviewing various articles.

Findings

This study provides the insights about the factors required to be considered for building a new hospital in a region (particularly in India). Various articles also, do not show all the factors that are needed to be considered to set up a new hospital. Therefore, this study integrates most of the needed factors which are crucial for hospital establishment.

Limitation

Limitation of this study was that the study was on Indian context. Setting up a hospital outside India was not taken under consideration. However, foreign journals and articles were taken for this study purpose.

Practical implication

This study will have practical utilization for building a new hospital as it gives an overall idea about what are the factors that are crucial before hospital setup. Therefore, it will be practically effective for the stakeholders.

Value

This article integrates most of the parameters which are necessary for hospital establishment, and therefore it may benefit the stakeholders.

Keywords

Hospital establishment factors, Demand for healthcare, Hospital setup MCDM, Health need assessment, Hospital location selection, Demographics, Population health, Population density, Industrial health centre, Per capita income, Clinical establishment act, Bed occupancy rate, Average length of stay, Resource allocation, Hospital marketing.

Research type

Literature review

Introduction

Healthy people are the centre of sustainable development, and people have long worked to improve and preserve their health through accumulating health resources. In general, increasing each person's level of health depends heavily on the demand for and usage of medical services[1]. The desire for health leads to a demand for healthcare, which is influenced by a variety of factors like cost, income, population, etc. [1].

The overall caliber of the patient experience is still significantly influenced by the structural quality of a healthcare system[2]. The framework of the facilities, that function as the homes of high-quality healthcare, is designed to give patients a smooth transition from disease to wellness while giving their loved ones a certain sense of relaxation[2]. The infrastructure and facilities of the healthcare system as a whole are always evolving, and there is always potential for improvement. Although they are enabling patients to obtain cutting-edge medical care, newer technologies are also presenting new infrastructure problems to healthcare professionals[2]. The built environment and particular components of healthcare infrastructure, such as architecture, design, commissioning a new hospital, sustainability, and information technology, require viewpoint from prominent individuals[3]. The hospital, which serves as a hub for acute and inpatient care, must be integrated into the larger health care system. Infrastructure also needs to support the patient experience, effectiveness, efficiency, timeliness, safety, equity, and sustainability domains of quality[3]. Infrastructure consists of the constructed environment as well as auxiliary components including tools, access, IT systems and procedures, sustainability initiatives, and personnel[3]. Regardless of age, disorder, or social circumstances, the patient

should be able moving effortlessly from the initial referral through community hospitals to specialist tertiary centres and discharge to appropriate care (home, care facility, or community hospital with intermediate care)[3]. Wherever possible, healthcare facilities, especially hospitals, should be integrated into the larger community to increase accessibility, societal support, and wellbeing[3]. The lack of institutions and healthcare facilities, combined with the lack of suitable human resources, are some of the problems that India's healthcare system has been dealing with for a while[4]. The primary, secondary, and tertiary care services constituted the basic three-tier structure of the Indian healthcare system. According to the Indian Public Health Standards (IPHS), district and sub-district hospitals provide secondary care, while sub-centers, primary health centres, and community health centres (CHC) provide primary healthcare to rural residents[4]. On the other side, super specialty hospitals or regional/central level institutions provide tertiary care [4]. The focus on all the 3 levels for improvement is of utmost importance[4].

Every person of our nation has a fundamental right to healthcare. The delivery of healthcare is supported by doctors, nurses, and other medical personnel in hospitals, nursing homes, clinics, medical camps, and other facilities. Unfortunately, while having a large and expanding population, India has fewer hospitals[5]. For every 879 patients, India has one hospital bed. The global average of 30 hospitals per 10,000 people is much higher than this. According to the WHO, India requires 80,000 extra hospital beds annually to accommodate its expanding population[5]. A report titled "India Tourism Market Outlook (2022-2032)" predicts that by 2032, medical tourism in India will generate US$ 42,237.47 million. According to the same source, India makes up about 6.5% of the global market for medical tourism. India is quickly becoming one of Asia's top destinations for medical tourism. Foreign medical tourists are drawn to urban healthcare facilities by the excellent quality and comparatively low costs of Indian healthcare services[6]. This highlights the need for more hospitals to be built at a faster pace[6]. In India, the quality of healthcare services varies significantly between rural and urban locations. First off, while the majority of people in India reside in rural areas, the healthcare infrastructure is primarily focused in metropolitan areas. India's rural healthcare systems are in a dire state, and this creates a significant rural-urban healthcare gap. Access to quality medical care is challenging for citizens of the poorest states[6]. During the Covid-2019 outbreak, the deficiencies of India's rural healthcare system came to light more clearly. In metropolitan regions, however, the situation is radically different. Here are most of the private hospitals. In India, the private

healthcare sector is developing quickly[6]. Whether servicing an urban or rural population, a hospital at any level is an essential component of the healthcare system and has a crucial role to play in achieving health for all[7]. The role and effectiveness of a hospital can be impacted by significant elements including geographic, demographic, economic, sociocultural, and epidemiological characteristics, as well as health status[7]. Before opening a new hospital in a certain location, many considerations must be made[7]. Unfortunately, many developing nations construct brand-new hospitals and outfit them with high-tech equipment without first performing the complete research that is required before such a project is carried out[7]. Therefore, the relevant data have to be gathered, reviewed, analyzed and evaluated in order to assess the real need of a population for inpatient services[7].

Rational

A vital component of any healthcare system is the establishment of hospitals. People with various illnesses and injuries are able to get medical care, treatment, and rehabilitation services in hospitals. To make sure that patients obtain top-notch healthcare, hospitals must be established effectively. India is a developing nation, and just like other developing nations, it contains sub-urban areas, many of which are unplanned, crowded, and lacking in many basic amenities. Therefore, any haphazard establishment of a hospital could result in a number of issues and difficulties that could have a negative impact on the standard of healthcare services offered to patients. For this reason, there are significant factors that should be researched before opening a hospital in a specific area.

Objective

1. To understand and study the important factors that are needed to be considered to establish a new hospital in a region.

Methodology

Study design: - Literature review

Data type: - Secondary data

Sample size: - 63

Sampling method: - A total of 63 articles, records, journals, documents were studied from various sources such as PubMed central, National Library of Medicine, Scribd, Government websites, WHO, etc. Among these, 38 articles were relevant to the study and matched with the keywords; therefore, these articles have been included in the study. As per exclusion of records is concerned, a total of 25 articles / records / journals / documents were excluded. The exclusion was on the basis of mismatching of title, irrelevance of the context, keyword mismatching, absence of required parameters for the study.

Inclusion Criteria: - Hospitals within India

Exclusion criteria: - Hospitals outside India

Expected outcomes

The study of factors for establishment of a hospital in India is expected to lead to several outcomes;

- **Better healthcare service**: -

  Stakeholders can identify and understand critical factors which are involved in establishing a hospital. They can also survey the market and get aware of the information about what kind of high-tech solution and qualitative service is being used in different hospitals. The market research is done to provide better understanding of the competition in the market. It improves overall healthcare service.

- **Increased employment opportunities: -**

  Establishing a hospital can create employment opportunities for healthcare professionals, support staff, and administrative personnel, thereby contributing to the economic development of the community.

- **Better access to healthcare: -**

  Stakeholders can identify strategies to improve access to healthcare services for underserved and marginalized populations. This can help reduce health disparities and improve health equity.

- **Better resource allocation: -**

  By taking a strategic and evidence-based approach to hospital establishment, stakeholders can make informed decisions about resource allocation, staffing, infrastructure development, and regulatory compliance. This can help maximize the impact of investments and ensure that the hospital is financially sustainable in the long term.

- **Advancement of medical knowledge: -**

  Hospitals can serve as centers for medical research, helping to advance medical knowledge and improve healthcare outcomes. The study of factors for establishment of a hospital in India can help identify areas of research that are relevant to the Indian context and contribute to the advancement of medical knowledge in the country.

Literature Review

A study was done by Saeed Assefzadeh on assessing the need to establish a new hospital where it talked about how numerous factors have to be taken into account before setting up a new hospital in a certain area[7]. This study has emphasized on the fact that many developing nations set up hospitals with modern amenities and a variety of equipment without undertaking adequate research, which over time causes the hospitals to struggle in comparison to the competition in the market[7]. This study has also mentioned that irrespective of the serving area (be it urban or rural)

of the hospital, there are important variables which should be taken into consideration for setting up a new hospital[7].

Another study by Muhammet Gul on Hospital location selection also talks about the recent strategies and policies taken by the stakeholders or owners to upgrade health services by creating new hospitals[8]. According to this study, one of the most important decisions is where to locate the hospital and this factor must be given considerations by the government or stakeholders[8]. This study has talked about a multicriteria decision making (MCDM) perspective which gives the entrepreneurs or government a competitive advantage[8]. This study has mentioned a 5-stage process for location selection which is as followed; 1. Choosing the selected criterion, 2. evaluating the significance of certain requirements, 3. recommending a potential facility site, 4. Considering different facility locations and 5. Thinking about the final decision[8]**.** According to this study, choosing the right site is crucial when making an investment choice for medical facilities since it affects a variety of factors[8]. This situation makes it simple to represent the problem as an MCDM concept and identify the best solution[8].

As demand for health and healthcare in a population is concerned, a study was done by Alireza Ghorbani (As referenced in number 1). According to this study, demand depends on the size, age structure, and consumer preference of the population. If an area is densely populated or in a way if population increases in a particular region, then the demand also increases for all goods and services. Preferences are the tastes and attributes of the people. In the event of disease, demand for healthcare is influenced by an individual's level of consumption. Infections thrive in overcrowded or heavily inhabited areas, making it easier for patients to access hospitals and receive medical care there. If a patient is satisfied with the medical supplies and medical services of a hospital, preference will be made among the population about that particular hospital resulting in more and more people may like to avail the services of the particular hospital which in turn will make the hospital's profitability increased.

A particular health blog in mindsea mentions that to provide qualitative service to the patients, providers must understand who the patients are[9]. That is why patient demographics are important[9]. Understanding the demographics makes it easy for the providers to make decisions based on each patient's need and situation[9]. According to this blog, if demographic data is

adequately gathered, healthcare practitioners may properly allocate the necessary resources to the entire healthcare system[9]. Demographic data can be used to determine which groups require the most assistance and attention[9]. Also, it provides a way for doctors and other healthcare providers to interact to patients on a personal level [9].

A study by Amit dang, et.al on economic evaluation talks about how study of economic data provides information to decision makers for efficient use of available resources for maximizing health benefits[10]. Analyzing economic data is a crucial method for assessing the costs and effects of various initiatives[10].

Another study on economic value of data for healthcare providers states that as per healthcare service consumption is concerned, it can differ based on per capita income, service price, education, and social norms[11]. An increase in per capita income shows that people have a high standard of living and can afford medical care[11]. In simple terms, economic evaluation states whether a target population will be able to pay for the costs or not[11]. It also indicates whether the stakeholders will be in economic advantage or not[11].

Evaluating bed occupancy rate, and average length of stay is also crucial for setting up a new hospital[12]. A journal on health care activities by OECD states that average length of stay in hospitals is frequently used as a gauge for how effectively healthcare services are provided[12]. With all else being equal, a shorter stay will result in reduced per-discharge costs and a shift of care from pricey inpatient institutions to more affordable ones[12]. Longer stays may be a sign of ineffective care coordination, which causes some patients to wait unnecessarily in the hospital until long-term care or rehabilitation can be arranged[12]. However, some patients may be released too soon from the hospital when a longer stay might have improved their health outcomes or decreased their risk of re-admission[12].

A study by Tommy Varghese on bed occupancy rate states that the most crucial factor in assessing how well hospitals is being used continues to be the bed occupancy rate[13]. Accordingly, numerous studies have advised closing underutilized hospitals beds and redistributing hospital beds[13]. Bed occupancy rate has financial implications for hospitals[13]. Higher occupancy rates typically signify efficient resource use, which can lead to higher revenue and more stable finances[14]. On the other hand, low occupancy rates could result in inefficiencies,

underutilization of resources, and potential income loss[14]. Hospitals can achieve a balance between patient care and financial viability by maintaining an ideal bed occupancy rate[14].

Key Findings / Result

Each country has a different level of access to accurate and thorough information about the socioeconomic and health status of the population. Ad hoc or routine data collection, however, may be utilized in this regard. Cross-sectional research among the target population and pre-existing health organizations might be useful in situations when information is uncertain, as in the majority of developing nations. In order to forecast the public's future hospital needs, trend studies can be performed using existing data, such as medical records, epidemiological reports, and periodic censuses. The following information needs to be gathered and examined:

1. **Need Analysis of the hospital**

   - **Population density**

     - **Demand for healthcare services**: Population density reflects the number of people residing in a given area[15]. larger population density areas typically have more prospective patients and a larger need for medical services[15]. By establishing hospitals in significantly inhabited locations, one can be confident that there will be sufficient demand to fund the facility and make it profitable[15].

     - **Accessibility and proximity:** The term "accessibility" refers to a variety of multifaceted concepts that determine the effectiveness of admissions procedures and a range of support services[16]. Potential accessibility assures that every member of a population has the best possible access to comprehensive and high-quality medical care within a limited supply of medical service providers[16]. One of the essential components for maintaining the status of a modern civilization is having enough access to healthcare services[16]. Accessibility is defined by the World Health Organization (WHO) as the availability of health services within a safe and reasonable physical reach to all sections of the population, especially vulnerable and marginalized groups like women, children, elderly people, and people with disabilities, including in rural

areas[16]. The presence of a hospital nearby is essential in densely populated places as it speeds up access to emergency medical care and minimizes travel time[16]. In situations of emergency, such as during medical emergencies or accidents, where every minute counts, proximity plays a vital role[16]. Many studies use a variety of methods to define the underserved areas of these healthcare facilities and to clearly grasp how accessible they are[16]. For maximizing the geographic accessibility to medical treatments, and other medical services, geospatial techniques or approach are frequently applied in a variety of healthcare-related fields of study[16].

- **Public health considerations:** Due to demographic factors, densely populated locations may experience particular health issues like infectious disease epidemics, greater incidence of chronic diseases, or particular healthcare needs [17]. By building hospitals in these locations, healthcare practitioners can focus on managing the specific needs and health obstacles faced by the local population, improving the state of the public health as a whole. The role of healthcare organizations and providers in promoting public health needs to be seen in a more comprehensive way[17]. They notably have a duty to act as public health role models, health promotion advocates, and infection control agents for their patients, staff, and the general public[17]. Health care providers and institutions can fulfil their professional obligations and take advantage of their special chances to shape health behaviour by integrating these activities into the operations of their facilities[17].

❖ **Demographic and social data such as:**

- **Understanding the Demographics**: Demographic data reveals a lot about population's size, age distribution, socioeconomic status, and common health issues[18]. This information is very much essential for organising the variety of medical services and specialised departments needed to properly address the community's healthcare present and future demands very effectively[18].

- **Assessment of health needs based on social data**: Healthcare professionals can estimate the population's health requirements using demographic and social data[19]. Healthcare providers may identify or understand the areas of need and prioritise treatments by examining data on healthcare utilisation, the incidence of chronic diseases, and social determinants of health, such as income, education, and housing[19].

- **Analysis of Demography**: Age, gender, ethnicity, and other demographic details about the population can be obtained via social data and the demographic data itself[19]. It can assist healthcare professionals in creating focused programs and services that cater to the particular health requirements of certain population groups[19].

- **Behavioural analysis**: Social data can shed light on societal health practices including smoking, physical activity, and food[19]. This data can be utilised to create health promotion initiatives that promote healthy habits and shield against chronic illnesses[19].

- **Increase cultural competency:** Understanding cultural competency plays a vital role. Practitioners should consider a patient's demographics when treating them because some life experiences and viewpoints may be correlated with those[20].

Some data are crucial for demographic and social factors such as: -

- Number of people to be covered by hospital services in the region
- Distribution of urban and rural population by sex and age
- Annual population growth rate
- Birth and mortality rates
- Literacy and Illiteracy rate

❖ Market competition and gaps

- Consumers now dominate the healthcare industry and demand high-quality care at fair prices. Due to competition and the exploding number of corporate hospitals in India, the industry structure is undergoing significant changes which is noticable[21].

- Being aware of Marketing culture is of utmost importance to set up a new hospital. The reason behind this is, it allows the hospitals to grow its business by understanding the competition in the market and helps achieve new heights in the market[21].

- A hospital mainly focuses on demand of patients; and in order to compete in the market or to be the best among the competitors or in a way, to maximize its revenue generation, a hospital must focus on the demands and satisfy all of them[21].

- To make a hospital exclusively outstanding in the market, it must be built considering all the patient driven thinking and level of care. In addition to that, all of the specialized services should be included to be at per with the competition[21].

- Stakeholders or owners can also take help of gap analysis for effective establishment of a hospital. Gaps in healthcare market do exist. Gaps are mainly the difference between the need of the patients and the service that is provided to the patients. Gap analysis can be done to improve the understanding of patient needs in the market[21].

2. Feasibility study

❖ Area

- The choice of a hospital location is among the most crucial policy concerns that the government and health officials pay attention to To ensure that health services are effective, high-quality, and equitable, it is crucial to choose the best hospital location for being one of the best in the market. (As referenced in number 8)

- The selection of the hospital's site is a considered choice. The site to be selected should be feasible and able to address any problems down the road. The poor location decision might result in considerable consumer discontent and expense increases. (As referenced in number 8)

- There are two categories of hypotheses for hospital location analysis, according to a study. The Weberian model, which concentrates on a single objective like the lowest cost or highest profit, is one. The "behavioural approach," which concurrently discusses elements to discover the ideal location. (As referenced in number 8)

- For patients to receive services from a specific hospital, transportation is equally crucial. A person's capacity to get adequate and well-coordinated healthcare, buy nourishing food, and otherwise take care of themselves is impacted by the accessibility of reliable transportation. Most likely to require transport services to preserve their health and well-being are rural communities.(As referenced in number 8)

- Strategic hospital locations are determined by a thorough analysis of the area, taking into account aspects like accessibility, proximity to important population

centres, transportation connections, and potential for future growth[22]. By selecting the ideal site, the hospital may be conveniently reached by the community it serves and maximize its influence and contact to grow in the market[22].

❖ **Resources allocation and evaluation:**

- At several scales—macro (national/regional), meso (institutional/territorial-hospital), and micro (at patient bedside—the allocation mechanism for the increasingly scarce health resources has drawn significant criticism)[23].

- The point of reference for the provision of health services is represented by the meso level, which in particular plays a crucial role in the management of resources[23]. Due to the rising number of demands from an ageing population with numerous pathologies who must be treated with limited out-of-hospital care options that aren't always successful, the health sector, and hospitals in particular, have been asked to manage fixed resources with respect to the increasing activity levels. It is also vital to establish the hospital's priorities and resource distribution standards[23].

- Evaluation can be done in strategic area, operating area etc.

- Strategic area –

  A = The Hospital's Importance on a Local, Regional, and National Level: This assessment talks about the level of significance attached to the action taken[23].

  B = The Importance of the potential for development: at local, regional and national level

  When deciding whether to approve or disapprove the request for additional funding for the hospital development programmes, this evaluation is crucial. Therefore, the top management will determine whether to support the

development and professional growth of a certain unit or component[23].

C = Necessary professional specificities even in the presence of enough personnel.
This assessment states the need to maintain a professional level in a given unit or component[23].

- Operating area –

  This area considers the medical staff, and it is helpful to determine whether or not their number is sufficient to the activity performed in a particular unit[23]. The number of doctors can satisfy the accreditation requirements, but it must be taken into account that these are minimal standards and may not be adequate for the sort of work done in the particular unit. Medical staff availability is graded on a scale of 1 to 3. In this grading, 1 denotes under resourced, 2 denotes close to average whereas 3 denotes that the it is in the over resourced condition[23].

- Assessing resources enables hospital administrators to determine the availability and suitability of physical infrastructure, including buildings, land, utilities, and medical equipment24. It also offers insights into the financial requirements of creating a hospital. It offers information on the costs involved in starting a hospital. It aids in estimating the costs of acquiring and maintaining resources, and evaluation enables hospitals to spot potential operational bottlenecks or inefficiencies[23].

❖ **Applicability of laws and regulations like Clinical establishment act standards for hospitals**

- The Clinical Establishments (Registration and Regulation) Act, of 2010, was introduced by the Central Government to regulate the registration and regulation of all clinical establishments in the nation with a view to establishing the minimal requirements of the facilities and services they must offer.

- The minimum standards for Allopathic hospitals Under Clinical Establishment Act, 2010 are developed on the basis of level of care provided[24].

- **Hospital Level 1 (A)-**

  General dentistry services supplied by recognized BDS graduates as well as general medical treatments with indoor admission facilities offered by recognized allopathic medical graduate(s)[24].

- **Hospital Level 1(B)-**

  All general medical services provided at level 1(A) above as well as specialized medical services provided by physicians from one or more basic specialties, including general medicine, general surgery, pediatrics, obstetrics & gynecology, and dentistry, providing indoor and OPD services, are included in this level of hospital[24].

- **Hospital Level 2 (Non-Teaching)-**

  This level may include all services offered at levels 1(A) and 1(B) as well as services provided by the additional medical specialties listed below, in addition to the primary medical specialty listed under level 1(B), such as: orthopedics, ENT, ophthalmology, dental, emergency with or without ICU, anesthesia, psychiatry, skin, pulmonary medicine, rehabilitation, etc[24].

- **Hospital Level 3 (Non-Teaching) Super-specialty services –**

  All services offered at levels 1(A), 1(B), and 2 as well as services from one or more super specialties with separate departments and/or dentistry, if available, may be included at this level. It will include additional supporting systems needed for services like pharmacies, imaging facilities, labs, and operating rooms, among others[24].

- **Hospital Level 4 (Teaching) –**

  This level may possibly contain Level 3 facilities, in addition to all the services offered at Level 2. But it will stand out as a teaching and training facility, and it might or might not have super specialities. At this level, experts and, if available, superspecialists can provide tertiary healthcare services. Other support systems that are necessary for these services will be present. It will be subject to their regulations and incorporate the MCI's or another registering body's requirements for teaching hospitals[24].

❖ Financial analysis

- **Per capita income per year or financial affordability:** By establishing a hospital in such an area, more people may be served, providing an ongoing supply of patients and possible revenue[25]. In addition to these factors, industrial regions often have well-developed infrastructure, such as dependable water, sewage, and power supplies, which are essential for running a hospital efficiently and assuring patient safety and comfort[25]. This contrasts with other popular measures of an area's prosperity such household income, which counts everyone living in one household, and family income, which considers everyone living in the same household who is connected to another person by birth, marriage, or adoption as a family. Higher per capita income suggests that people are better able to pay for healthcare services and medical treatments[25]. A hospital needs to make a sizable investment in its physical plant, its medical inventory, its personnel, and its overhead[25]. A larger pool of potential patients who can afford to pay for healthcare services is implied by higher per capita income, generating sufficient revenue to cover costs and assure the hospital's efficient operation[25]. Greater investment and development projects are frequently attracted to areas with higher per capita income[25]. This opens up possibilities for philanthropic donations, healthcare collaborations, and public-private partnerships to support the opening and expansion of a hospital[25]. Although per capita income is a widely used indicator, it has several

drawbacks[25]. Per capita income is not usually a reliable indicator of the standard of life because it divides the entire income of a population by the total number of individuals[25]. To put it another way, the data may be distorted, failing to take into account economic inequality[25].

- **Number of industrial centres, factories, and manufacturers:** Setting up a hospital in close collaboration with other health services can best serve an industrial area or a huge industry[26]. This centre must try to achieve not only worker adaptation to the machine and the task but—even more crucially—machine and working method adaptation to the physical and mental capacities of man[26].

  Industrial areas often have well-established transport systems, such as highways, railroads, and airports, which facilitate simple access for patients, medical personnel, and supplies, providing prompt healthcare services[26]. These areas are also renowned for their economic stability and growth potential, which creates a welcoming atmosphere for healthcare investments and guarantees the hospital's long-term financial viability[26]. Due to the concentration of inhabitants and workers, industrial centres typically have greater populations and higher healthcare demand[26]. By establishing a hospital in such an area, more people may be served, providing an ongoing supply of patients and possible revenue[26]. In addition to these factors, industrial regions often have well-developed infrastructure, such as dependable water, sewage, and power supplies, which are essential for running a hospital efficiently and assuring patient safety and comfort[26].

- **Bed-occupancy rate:** The hospital occupancy rate is a measure that offers crucial data for evaluations and decision-making[27]. It is a management indicator that offers data on the hospital's service capacity, assisting in determining whether any beds are vacant or missing as well as the suitability of the available space[27]. This index allows for the dimensioning of the user's average stay at the institution, their replacement intervals, and their consumption profile[27].

The percentage of patients seen daily and the number of hospital beds available are used to compute the hospital occupancy rate[27]. It is important to keep in mind that blocked beds are not included in this computation[27].

- **Average length of stay:** The average length of stay (ALOS) is a crucial gauge of a hospital's management effectiveness. It has a direct effect on hospital resource management[28]. It assists hospitals in estimating the quantity of beds, personnel, and other resources required to care for patients[28]. Monitoring this variable enables medical facilities to evaluate and control patient flow[28]. A reduced average length of stay shows that patients are receiving prompt care and are being transferred or dismissed[28]. This boosts efficiency overall by boosting patient flow, decreasing wait times, and enabling hospitals to serve more patients in a given time frame[28]. Healthcare expenses and the typical length of stay are closely related[28]. Costs for patients, insurers, and the hospital itself may increase as a result of a longer average duration of stay[28]. Hospitals can control and shorten the average length of stay to cut expenditures, increase cost effectiveness, and maximise resource utilisation, resulting in long-term financial viability[28].

- **Average cost per bed:** Hospital beds can have two different sorts of value: (1) the accounting cost, which the WHO refers to as the hotel cost, and (2) the value they have in terms of attaining desired outcomes, which is known as the economic (or opportunity) cost[29]. The accounting cost of a particular form of is frequently used in previous cost-effectiveness evaluations[29]. This is mainly because, especially for hospital management, it is a simpler metric to calculate and comprehend[29]. The question that arises is whether or not adopting this value is the "right" thing to do[29]. The second value, the economic cost, may be the true value in which we "should" be most concerned[29]. The "true" value of releasing a hospital bed is better measured by the extent to which it enables one to achieve other outcomes that the hospital desires, such as treating another patient, reducing waiting lists, and ultimately meeting economic targets[29]. This

is because the majority of bed costs are fixed and sunk costs[29]. Instead of using accounting principles to recover previous costs, an accounting value fails to capture economic opportunity costs[29]. WTP may be more in line with the economic opportunity cost, which serves as the basis for decision-making and whose effectiveness is the focus of welfare economics[29].

Estimating the initial investment needed to buy beds for the hospital is made easier by being aware of the average cost of beds[29]. It enables precise financial planning and budgeting, ensuring that enough money is set aside for this crucial infrastructure[29]. Hospital administrators can anticipate recurring costs for bed upkeep, repairs, and replacement by knowing the typical cost. It also affects choices about how many beds a hospital can afford to have[29].

3. Project Management

❖ Stages of project management

- The project management stage would contain a variety of stages. Project conceptualization, which is done at the very beginning of hospital planning or hospital establishment, is one of the crucial stages[30]. Project conceptualization stage is followed by other stages such as feasibility analysis (the project concept is understood, project cost is estimated, profit and loss are estimated), Hospital design, Project management and then commissioning the hospital[30].

- It is a fallacy that an architect will always make a competent project manager. Even from the perspective of a layperson, it shouldn't be too challenging to comprehend that the architecture should easily accommodate the complexity of engineering services and the installation of extremely expensive medical equipment - aside from the various financial and time-related issues involved in project execution[30]. Some of the crucial elements of project management include handling design changes midstream, managing all tendering operations, the quality of construction, site safety, and bill certification on a regular basis[30].

❖ Infrastructure demand

- **Assessing Healthcare Infrastructure Demand**: The demand for healthcare services can be determined by examining the region's current healthcare infrastructure, services, and gaps[31]. It assists in identifying the different medical facilities needed to fill such gaps and serve the community's needs, such as tertiary care hospitals, primary care clinics, and specialised clinics[31].

- **Identifying Health Challenges**: Specific health issues affecting the community, such as infectious diseases, chronic ailments, or environmental factors affecting public health, can be identified by a thorough analysis of the area[32]. Understanding these difficulties enables healthcare professionals to concentrate on preventive measures, effectively allocate resources, and customize healthcare initiatives to address the particular health conditions impacting the population[32].

- **Analysing Infrastructure and Resources**: In order to decide if it would be feasible to build a hospital in a specific location, it is crucial to evaluate the area's current infrastructure, including transportation systems, utilities, and the availability of resources like water and power. High-quality healthcare services and the efficient functioning of medical institutions require adequate infrastructure and resources. (As reference in number 22)

❖ Number of beds (by department or ward)

- Allocating number of beds is crucial quantitative indicator[33]. It tracks the number of healthcare services offered by hospital. A wide range of variables, such as care delivery models, patient demand, government laws, and regional conditions, affect the quantity of beds required to provide high-quality healthcare[34]. The goal of national policy is to figure out how to meet this need. Internal hospital operations, the availability of additional services, and elements affecting regional demand management are examples of local variables[34]. At many levels of the health system,

politicians and management make decisions about the number of hospital beds available. Here, two key considerations should be made: the levels of planning Strategic, tactical, and operational hospital bed capacity, as well as the short, medium, or long-term outlook for the number of hospital beds[34]. While tactical planning takes place at the hospital level, strategic planning of hospital capacity is concerned with foreseeing long-term regional demands. The operational level is concerned with selecting the best number of beds to assign to each hospital department[34]. The capacity of a hospital has a direct impact on its financial planning. Based on variables including patient volume, typical duration of stay, and reimbursement rates, it assists in estimating revenue possibilities[34]. For budgeting, choosing price options, and guaranteeing the hospital's financial stability, accurate bed sizes are crucial[34].

❖ **Medical equipment**

- Decision-makers in the healthcare industry are faced with difficult and complex investment decision challenges due to the size and extent of the healthcare technological change[35]. The range of activities includes the steps, tools, and processes involved in providing medical treatment[35]. The cost of daily activity medical equipment, the cost of technology or systems that deal with patient data storage, etc. are among the spectrum of investments[35].

- Due to the loss of the rupee and inflation, which has increased import costs, the Medical Technology Association of India, which represents medical device businesses, has requested an increase of up to 18% on the MRP of medical equipment, including stents and orthopedic knee implants[36].

Discussion and Conclusion

The performance of many other components of the healthcare system is enhanced and complemented by hospitals, which continuously offer treatments for both acute and complicated diseases[37]. In order to efficiently fulfil community health wants and needs, they focus limited resources within well-planned referral networks[37]. They are a crucial component of universal health coverage (UHC) and are necessary to achieve the Sustainable Development Goals (SDG)[37]. Hospitals are also an essential part of health system development[37]. Currently, external pressures, health systems shortcomings and hospital sector deficiencies are driving a new vision for hospitals in many parts of the world[37]. In this vision, they have a key role to play to support other healthcare providers and for community outreach and home-based services and are essential in a well-functioning referral network[37]. Establishing hospital quality services is an important task that needs to be monitored by every business organization and stakeholders[38].

A lot of consideration must be paid to build a new hospital in a specific area. These factors should ideally be investigated as part of a study proposal, which would provide a framework for identifying bottlenecks and shortages as well as determining the market's actual demands. Decisions should be made by an ad hoc committee in accordance with the national health strategies. Project conceptualization, which is done at the very beginning of hospital planning or hospital establishment, is one of the crucial stages. Project conceptualization stage is followed by other stages such as feasibility analysis (the project concept is understood, project cost is estimated, profit and loss are estimated), Hospital design, Project management and then commissioning the hospital. The project conceptualization stage is an early phase during which the involved parties make an effort to imagine the ownership, guiding principles, bed mix, facility mix, etc. of their hospital (As referenced in number 30). This necessitates, at the very least, conducting a basic but thorough investigation into the physical and geographic surroundings of the prospective region. Most importantly, this information can be found online, in recent and old newspaper articles, in municipal reports, and by conducting a brief poll. The fundamental concept is to identify any holes in the local medical market and make plans to fill them, unless the business owner is a physician or entrepreneur who is crystal clear on his objectives. In this study, various factors for hospital establishment were taken into consideration.

Various articles which were relevant to the study were studied and the factors were integrated to provide a thorough understanding about the pre-requisite for hospital establishment. The finding was, that knowledge of the crucial factors such as area, population density, demographics, economic data, health status of the population etc is very much important for setting up a hospital in a region. Among a lot of articles none of those showed every one of the factors. However, this study focuses on integrating most of the important factors and provide a thorough understanding so that stakeholders may utilize it.

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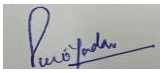

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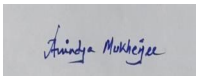

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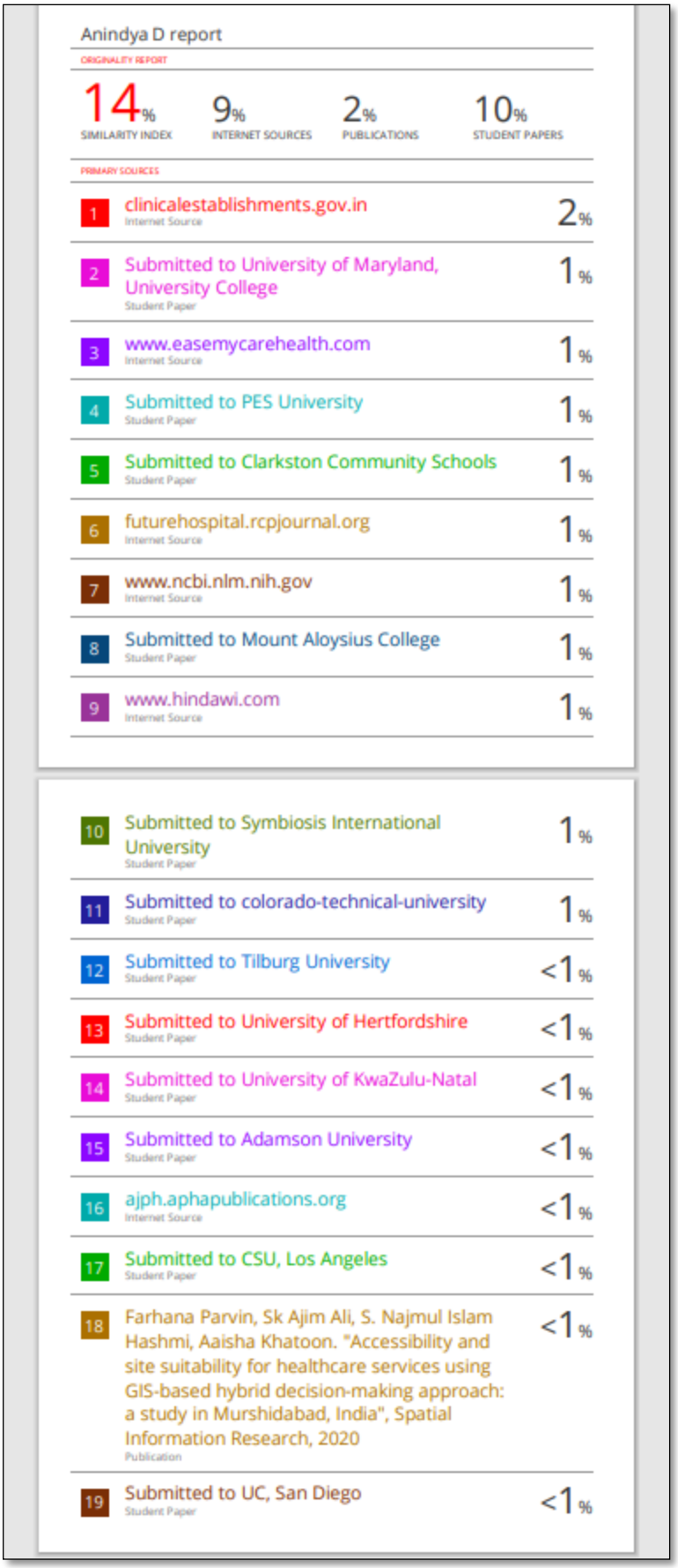

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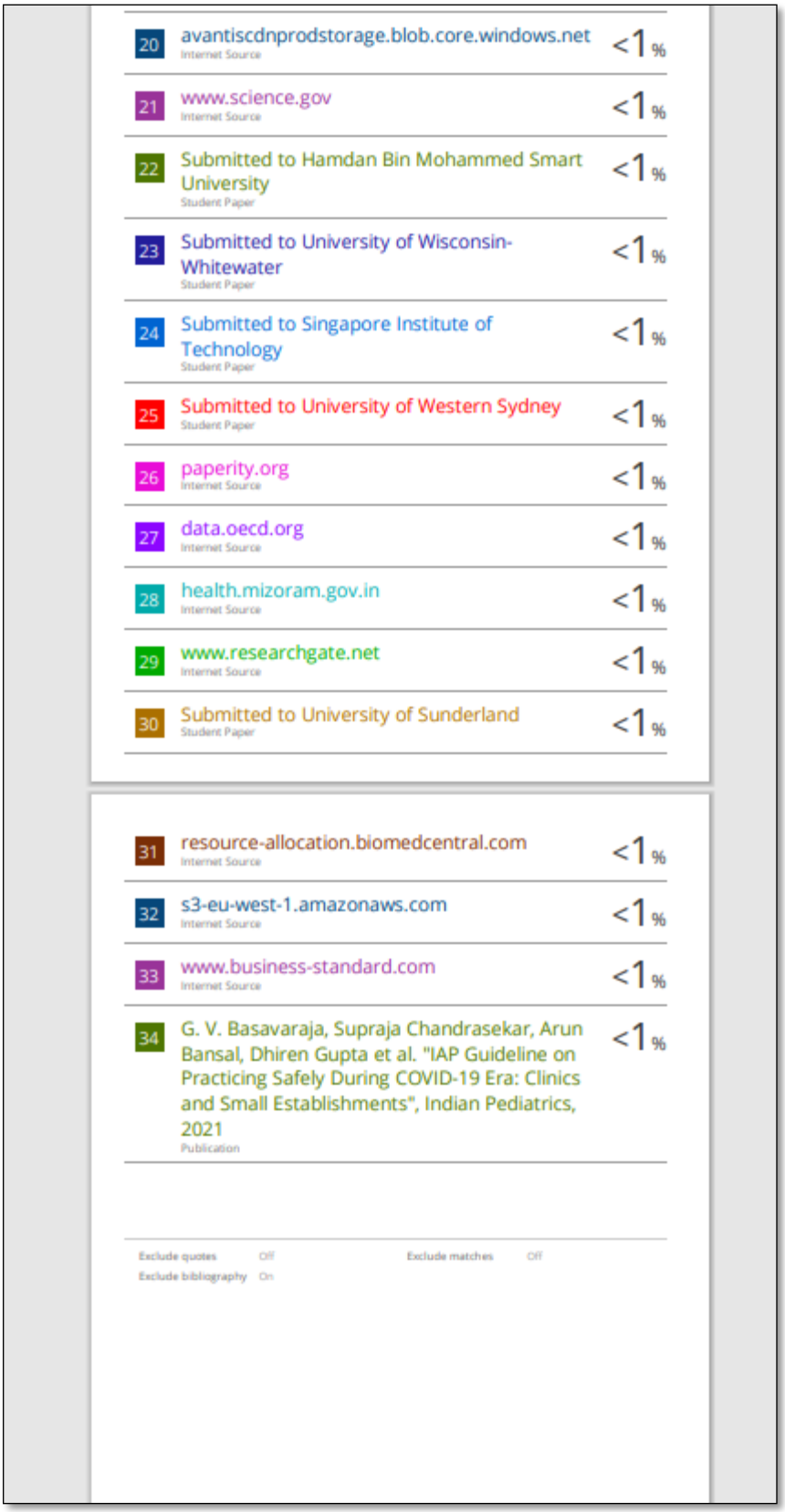

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