

Transdisciplinarity of India's Master's Level Public Health Programmes: Evidence from Admission Criteria of the Programmes Offered Since 1995

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Research

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Abstract

Background

In Indian subcontinent, Master's level public health (MPH) programmes attract graduates of diverse academic disciplines from health and non-health sciences alike. Considering the current and futuristic importance of the public health cadre, we described them and reviewed their transdisciplinarity status based on MPH admissibility criteria 1995 to 2021.

Methods

Using a search strategy, we abstracted information available in the public domain on MPH and their admissibility criteria. We classified disciplines specified for admission into Science, Social sciences and Arts, Health and Non-health categories. We described the MPH programmes by location, type of institutions, course duration, pedagogical methods, specialisations offered, and nature of admission criteria statements. We calculated descriptive statistics for eligible educational qualifications for admission to MPH programmes.

Results

Overall, 74 Indian institutions offered 88 MPH programmes. We included 85 for review. These programmes represent 50% increase (n = 44) from that of 2016-17. They are mostly concentrated in 21 provinces and union territories of India. These programmes stated that they admit candidates of but not limited to "graduation in any life sciences", "three-year bachelors degree in any discipline", "graduation from any Indian universities", and "graduation in any discipline". Of the 72 institutions, 14 admit multidisciplinary academic graduates in their 16 programmes. Except three institutions from public sector, 69 provide MPH admission opportunities to multidisciplinary health and non-health academic graduates.

Conclusion

Our review suggests that India's MPH programmes are less transdisciplinary. India's Master's level public health programmes should transcend to be more inclusive and admit graduates of various academic educational backgrounds.

Introduction

Globally, public health education and practice have been transcended and evolved as a transdisciplinary academic discipline (1–5). The inter-connections between population health, environment, globalisation, climate change and political-demographic-socio-economic-cultural factors demand transdisciplinary research methods and approaches to identify the problems and solutions for the emerging complex global public health problems (1, 6–10). Public health is a conglomeration of cross-cutting disciplines such as health sciences, allied health sciences, life sciences, economics, technology, humanities and social sciences, arts (11). Worldwide public health education and training are rendered as structured, university-affiliated transdisciplinary programmes to systematically nurture the talents and skills of the diversified pool of public health workforce in various countries

(12–18). The governments, global health experts and public are cognizant of the field of public health and the role of the diverse health workforce in resilient health systems addressing the pandemic (19–23). The public health professional has been defined broadly as "*professionals of any discipline working in any aspect of the field of public health, including in government and non-government sectors, on a full-time or part-time basis to improve health through a population focus*" (1).

Historically, public health has evolved as a multidisciplinary profession that exhibits organised collective efforts across multi-sectoral environments traced back to human civilisations' through purposeful construction of unique drinking water supplies and sewage drainage systems (24). The necessity of "Public Health Workforce" and the need for diverse, dedicated, competent public health professionals had never been felt so more critical across the globe than during the ongoing Coronavirus Disease 2019 (COVID-19) crisis (25–27). With the emergence and resurgence of zoonotic diseases, anti-microbial resistance, and multi-factorial chronic diseases, the "one health" approach has gained global importance (28). The international community has recognised the need for a professional workforce in "One health" and included the related concepts in their medical and public health training curriculum (29–31). India's heterogeneous health care system, underdeveloped public health governance, vertical disease control and health service delivery programmes necessitate the emergence of a cadre of competent professionals specially trained in public health (32, 33). As a dynamic and transdisciplinary scientific cadre, these professionals play a crucial role in realising the national health goals (34).

According to a review in 2016 by Tiwari et al., public health education is rendered by public and private sectors in medical and non-medical institutions in India, which predominantly includes a two-year Master of Public Health (35). However, what is not described is the transdisciplinary nature of these programmes based on their admission criteria. In fact, the model course curriculum for MPH drafted by India's Government in 2017 allows both Science and Non-science graduates to undertake MPH programmes without delineating 'science' and 'non-science' academic disciplines (36). In view of the absence of information on transdisciplinarity of India's Master's level public health programmes we reviewed, (1) inclusivity aspects by analysing the programmes' admission criteria, and (2) characterise the programmes by geographical location, type of institutions, course duration, pedagogical methods and specialisations offered.

Methods

Study design

We did a desk review of master's level public health education programmes in India.

Operational classification

We classified academic educational qualifications into four categories (1) science, (2) social sciences & arts and, (3) health, and (4) non-health disciplines for this study's scope (Table 1).

Table 1

Operational classifications for Science, Social sciences & Arts and Health and Non-Health Academic disciplines

Science	Social sciences & Arts	Health	Non-health
Bachelor of Medicine and Bachelor of Surgery (MBBS)	Management Studies (Public Administration, Health / Hospital Administration)	MBBS	Management Studies (Public Administration, Health / Hospital Administration)
Bachelor of Dental Surgery (BDS)	Development studies (Rural Development)	BDS	Development studies (Rural Development)
Bachelor's degree in AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha/Sowa-Rigpa and Homeopathy)	Law	Bachelor's degree in AYUSH	Law
Physiotherapy & Occupational Therapy	Humanities & Social Studies (Anthropology, Demography, Sociology, Social Work, Population studies, Social Science)	Physiotherapy & Occupational Therapy	Humanities & Social Studies (Anthropology, Demography, Sociology, Social Work, Population studies, Social Science)
Nursing	Behavioural Sciences (Psychology)	Nursing	Behavioural Sciences (Psychology)
Pharmaceutical Science & Studies	Journalism/Communication	Pharmaceutical Science & Studies	Journalism/Communication
Animal Husbandry & Veterinary science	Economics & Commerce	Animal Husbandry & Veterinary science	Agricultural Sciences
Lifesciences & Nutrition/Dietetics		Nutrition/Dietetics	Lifesciences
Medical technologies (Laboratory, Radio-imaging, Speech, Audiology)		Medical technologies (Laboratory, Radio-imaging, Speech, Audiology)	Statistics/Bio-statistics
Agricultural Sciences			Agricultural Sciences
Technology/Engineering			Technology/Engineering
Statistics/Bio-statistics			Economics & Commerce

Developing search strategy

Inclusion criteria

We included a Master's level public health programmes in the Public health discipline of two years ever offered in correspondence/online and on-campus mode during 1995–2021 in India's public and private sectors.

Exclusion criteria

We excluded programmes of less than 24 months of duration, diploma level programmes in public health, community medicine, public health management and three-year doctorate in medicine (MD) programmes in community health administration (CHA), preventive and social medicine (PSM), field-epidemiology training programmes (FETP) that does not offer formal degree, two-year administration (health and hospital) and management programmes.

Search strategy

Preliminary data regarding the existing MPH programmes were obtained from the review by Tiwari *et al* (35) (Fig. 1). In order to get additional programmes, we used keywords of "Master of Public Health", "public health courses", "public health training", "public health education", "MPH", "schools of public health", "public health colleges" and "public health universities". We explored the websites of India's education regulatory bodies such as the All India Council of Technical Education (AICTE), University Grants Commission (UGC), universities, and institutions for finding programmes satisfying the inclusion criteria. We limited our search to public health programmes offered by Indian or any Indo-foreign institutions jointly. We reviewed brochures and prospectus of public health schools and universities in India available on the home pages of the institutions that ever offered master's degree in public health discipline. We did not analyse the programmes that do not have adequate information on admission criteria.

Data abstraction

We abstracted the data in a structured data extraction form. Using our search strategy, we abstracted information regarding each programme on (a) Name of the institution; (b) institution type (public/private); (c) affiliated university; (c) geographical location (district and state);(d) course delivery mode (on-campus [full-time/regular] OR correspondence [online/distance] or both);(e) number of seats; (f) degree specialisation; and (g) applicants' educational qualifications eligible for admission into the course.

Analysis plan

We calculated descriptive statistics for the admissible educational qualifications for the programmes as per our operational classifications. Further, we profiled the programmes in terms of geographical location, type of institutions, course duration, pedagogical methods and specialisations offered. We used an open-source geographic information system QGIS version 3.0.3 software, and two geography data layers (ne_50m_admin_0_countries, ne_50m_admin_0_disputed_areas) from Natural Earth open source website and generated a spot map to present the distribution of the programmes (37). We counted the number of programmes and treated each specialisation degree as a unique programme irrespective of the same institution offering in the same or multiple geographies.

Results

Public health programmes identified and included

We could identify 89 programmes (Fig. 1). There were 82 MPH, three Master of Science (M.Sc), one dual degree Master of Public Health with Master of Business Administration (MPH/MBA) and one Master of Arts (MA) degree programme by 74 institutions or universities. An additional table file shows this in more detail (Additional file 1).

Descriptive profile of the public health programmes

Geographical distribution

Of the 88 masters' level public health degree programmes, 55 (62%) are offered in private institutions, and 33 (38%) are in the public sector. An additional table file shows this in more detail (Additional file 2). All these programmes are concentrated in 21 States and Union territories of India. The majority of the programmes, 30 (34%), are offered in the southern region, followed by 29 (32%) programmes in India's western region (Additional file 2). Of 33 programmes provided by public institutions, 22 (69%) are located in southern and northern regions. There are no government public health programmes offered in the Northeast states (Fig. 2). Of 55 private programmes, 11 (20%) are in Karnataka, followed by eight (15%) in Rajasthan (Fig. 2).

Duration of the programme

Of the 88 programmes offered, 87 are of two years' duration and one 3-year programme at the All India Institute of Hygiene and Public Health (AIIPH), West Bengal, one of the oldest institutions offering public health training programmes.

Specialisations offered

Of 74 institutions, 53 (72%) do not offer specialisation as part of their programme, whereas 20 (28%) institutions (Public = 13 & Private = 14) offered 27 specialisation degree programmes in public health domains; such as Epidemiology, Social Epidemiology, Field Epidemiology, Global Health, Maternal and Child Health, Surveillance and Epidemics, Nutrition, Health Economics, Policy and Financing, Environmental and Occupational Health, Health Systems Management and Administration, Quality and Safety, Public Health Informatics. One institution offers a dual degree in Public health combined with a MBA.

Pedagogical methods

Of 88 programmes, two were distance learning offered by two institutions (Global Open University, Nagaland; Datta Meghe Institute of Medical Sciences, Maharashtra). Two institutions [Chitkara University and the Asian Institute of Public Health University (AIPHU)] offered two tracks of MPH course in collaboration with a foreign University [University of Nebraska Medical Center (UNMC), USA]. This programme has the option to obtain the degree either in India or abroad. The remaining 86 master's programmes in public health are taught on-campus. The course work covers standard public health fields, including epidemiology, biostatistics, environmental health, health policy and finance. Most on-campus programmes include one and half years of classroom learning and 3–6 months of practical/field experience, capstone dissertation projects.

Admission criteria of the public health programmes

Nature of statement of admissibility criteria

The eligibility criteria for master's public health programmes are variable and vague; for example, some institutions enrol graduates with a three-year degree, while some enrol four-year degrees; in contrast to some institutions admitting undergraduate (UG) health science graduates and postgraduate (PG) degrees for non-health science graduates. Some institutions accept graduates of any science stream or non-science stream or

any discipline graduated from UGC recognised universities. Eligibility criteria do not differ for the MPH specialisation degrees programmes offered by the same institution.

Some institutions give preference to candidates with prior experience in the health services and public health field. Twenty institutions offer programmes for sponsored candidates from the respective state governments and non-governmental organisations. One public institution out of 20 exclusively enrolls in-service MBBS graduates funded by the various sub-national health departments. Other 19 institutions have 5–60% reservation in their MPH programmes for sponsorship and their employees/minority quota.

Except, three public institutions, 69 institutions offer MPH programmes to multidisciplinary health science disciplines such as medicine, dentistry, AYUSH (an acronym representing systems of medicine patronised in India: Ayurveda, Yoga and naturopathy, Unani, Siddha/Sowa-Rigpa and Homeopathy), physiotherapy, occupational therapy, veterinary and animal husbandry and allied health-sciences (nursing, pharmaceutical studies, nutrition, microbiology, and laboratory/radio-imaging/medical technology) and non-health science disciplines such as engineering, statistics/biostatistics, demography, population studies, nutrition, sociology, economics, commerce, psychology, anthropology, social work, management, journalism, communications, life sciences, social sciences, management, law, arts, etc., to enrol for the programme. One private institution offers an executive MPH for in-service professionals of medical and dental graduates placed in both the public and private sector.

Distribution of the admission eligibility by academic disciplines

Among the science disciplines, all the programmes providing for the Medicine graduates (n = 85; 100%), followed by dentistry (n = 82; 96%) and Nursing (n = 80; 94%) (Table 2). Among the health science disciplines, veterinary science (n = 56; 65%) is the second least eligible for the programmes. Despite AYUSH graduates trained in health sciences, they are not eligible to enrol in 15% of the public institutions' MPH programmes.

Table 2
Number and proportion of various academic disciplines eligible for admission
in master's level public health programmes, India 1995–2021

Academic disciplines	Institution type, n (%)		
	Private (N = 52)	Public (N = 33)	Total (N = 85)
Science			
Medicine	52 (100)	33 (100)	85 (100)
Dentistry	52 (100)	30 (91)	82 (96)
Nursing	50 (96)	30 (91)	80 (94)
AYUSH	50 (96)	28 (85)	78 (92)
Physiotherapy	47 (90)	28 (85)	75 (88)
Medical technologies	42 (80)	25 (76)	67 (78)
Pharmaceutical Science & Studies	47 (90)	19 (58)	66 (77)
Nutrition/Dietetics	43 (82)	16 (48)	59 (69)
Animal Husbandry & Veterinary Science	39 (75)	17 (51)	60 (65)
Occupational therapy	36 (69)	17 (51)	53 (61)
Life Sciences	35 (67)	14 (42)	49 (58)
Technology & Engineering	32 (61)	12 (36)	44 (51)
Statistics & Bio-statistics	21 (39)	11 (33)	33 (38)
Agricultural Sciences	21 (39)	8 (24)	29 (33)
Social Sciences & Arts			
Humanities & Social Sciences	39 (75)	19 (58)	58 (68)
Behavioural Sciences	35 (67)	14 (42)	49 (58)
Economics & Commerce	27 (51)	10 (30)	37 (43)
Management Studies	24 (45)	9 (27)	33 (38)
Law	25 (47)	7 (21)	32 (36)
Journalism & Communications	2	1	3

Among the social sciences and arts category, for 2/3rd of the programmes, humanities and social science graduates were eligible (n = 58; 68%), followed by psychology (n = 49; 58%) and Economics and commerce (n = 37; 43%) graduates eligible to enrol for MPH programmes. Of the 74 institutions reviewed, 14 provide 16 MPH programmes to graduates of both science and social sciences & arts academic disciplines classified for this study.

Discussion

We reviewed admission criteria of India's Master's level public health programmes and identified that they are less transdisciplinary. Despite a doubling of these programmes in the recent five years, we determined that they mostly catered to the medical and allied health disciplines and offered limited scope for non-health, academic disciplinary graduates.

Conventionally, public health education in India has been offered as part of medical education and was offered only to medical and para-medical professionals (32, 38). In recent times, understanding and accepting this field's transdisciplinary nature may have led to doubling of public health institutions between 2016 and 2021. As these institutions are mostly outside the medical schools, it also encourages non-health and social sciences, arts academic graduates to enrol in their master's level public health programmes.

The degree of inclusivity involving non-health, allied health sciences and non-science academic graduates varies between public and private institutions. We find that private institutions offer a broader scope for the graduates of multidisciplinary educational backgrounds to get trained in the public health discipline than public institutions. There is currently no formal body for accrediting public health programmes, institutions, and professional bodies for continued learning and fostering the public health profession in India, specifically for private institutions' public health training. Being rendered mainly as a postgraduate course, bachelor and master degree holders from different educational qualifications get enrolled and exit. Due to lack of national policy for public health professional registration, practice and limited scope for the enrollment in professional bodies such as the Indian Association of Preventive and Social Medicine (IAPSM), Indian Association of Epidemiologist (IAE), and Indian Public Health Association (IPHA) the trans-disciplinary public health professionals lack an innate identity for themselves in India (35, 39, 40).

India's National Health Policy 2017 paved the road-map for establishing public health management cadres and appropriate career structure for the multidisciplinary public health professionals in the national and sub-national health departments (41). This vision was not materialised both at the federal and provincial level (42–45). Parallely, non-MBBS public health professionals were engaged as contractual staff in various national health programmes, national and sub-national health systems resource centres, federal and provincial health ministries and departments, bilateral organisations, private sectors, non-governmental and non-profit organisations and health research organisations in various capacities (46, 47). Nevertheless, in the last two decades until 2019, non-MBBS public health graduates have also been considered for regular positions in health research organisations of national importance.

Unlike in other countries, in Indian subcontinent, establishment processes of public health schools and programmes are less complicated and well-supported with financial, technical resources, political, and institutional support, as proved through a surge of programmes in the private sector, including undergraduate public health degree programmes (48, 49). Simultaneously, these private institutions should maintain the scholars' adequate 'standard' and quality and provide them with the knowledge, skills, and abilities necessary to become competent professionals to meet the needs of contemporary public health challenges and issues facing India and globally (50, 51).

Public health education practices in the Indian subcontinent require reform to shape the public health profession (32, 34, 38, 50, 51). India's model course curriculum for MPH programmes also stressed the need for

transdisciplinary public health professionals who have a basic understanding of the various determinants of health. Currently, public health programmes are skewed towards India's two regions, barring backward states with a huge burden of poverty and diseases of public health importance despite the need for a transdisciplinary public health workforce (52, 53). Further, the production of transdisciplinary public health professionals also demands national and provincial policies to ensure the relevance of these professionals, defined career pathway and equal employment opportunities in health and non-health sectors in the Indian subcontinent. Nevertheless, implementing a comprehensive One Health concept for addressing contemporary global health issues necessitates collaborative, coordinated, concerted actions across sectors and various disciplines, which can be achieved by having a transdisciplinary public health workforce (54, 55). Thus, public health training in low and middle-income countries (LMICs) should be inclusive and foster the transdisciplinary public health workforce and their competencies across the health and non-health sector to help achieve the nation's health goals (21).

Limitations

Our study included only the programmes for which information was available in the public domain, such as prospectus, brochures and websites. We captured a maximum number of programmes of pre-eminent public and private institutions that have ever offered master's level public health programmes in India through our search strategy. We believe programmes unidentifiable through our search strategy could be very minimal. Secondly, we could not verify the information with the respective institutions to confirm whether programme admission criteria are currently functional and remain unchanged for the current academic year. However, most of the programmes had their updated homepage at the time of review and hence, we think the misclassification is likely to be negligible.

Conclusion

On the basis of our findings, we conclude that India's master's level public health programmes are less transdisciplinary in nature. We recommend that they become more inclusive and are offered to students from diverse academic backgrounds to produce a competent transdisciplinary public health workforce to meet the needs of India's human resources for health and establish resilient health care systems.

Abbreviations

Word	Abbreviation
Master's level Public Health	MPH
Bachelor of Medicine and Bachelor of Surgery	MBBS
Bachelor of Dental Surgery	BDS
Ayurveda, Yoga and Naturopathy, Unani, Siddha/Sowa-Rigpa and Homeopathy	AYUSH
Community Health Administration	CHA
Preventive and Social Medicine	PSM
Field-epidemiology Training Programmes	FETP
All India Council of Technical Education	AICTE
University Grants Commission	UGC
Geographic Information System	GIS
Master of Science	MSc
Master of Arts	MA
Master of Business Administration	MBA
All India Institute of Hygiene and Public Health	AIIH&PH
Asian Institute of Public Health University	AIPHU
University of Nebraska Medical Centre	UNMC
Undergraduate	UG
Postgraduate	PG
Indian Association of Preventive and Social Medicine	IAPSM
Indian Association of Epidemiologist	IAE
Indian Public Health Association	IPHA
Low & Middle Income Country	LMIC

Declarations

Ethics approval and consent to participate

Ours is a desk review of publicly available information and did not involve collecting data from human participants.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article and its supplementary information files.

Competing interests

ICMR-National Institute of Epidemiology runs a two-year MPH programme affiliated to Sree Chitra Tirunal Institute for Medical Sciences (SCTIMST), Thiruvananthapuram, India.

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Authors' contributions

Conceptualization: MP, KI

Data curation: KI, KG, VV

Data analysis and Interpretation: KI

Visualization: KI, SM, VV

Project administration: KI

Writing – original draft & multilanguage abstract: KI

Writing – review & editing: KI, MP, SM, VV, KG, VV

All authors read and approved the final manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted. The views presented here are those of the authors and should not be attributed to ICMR-NIE.

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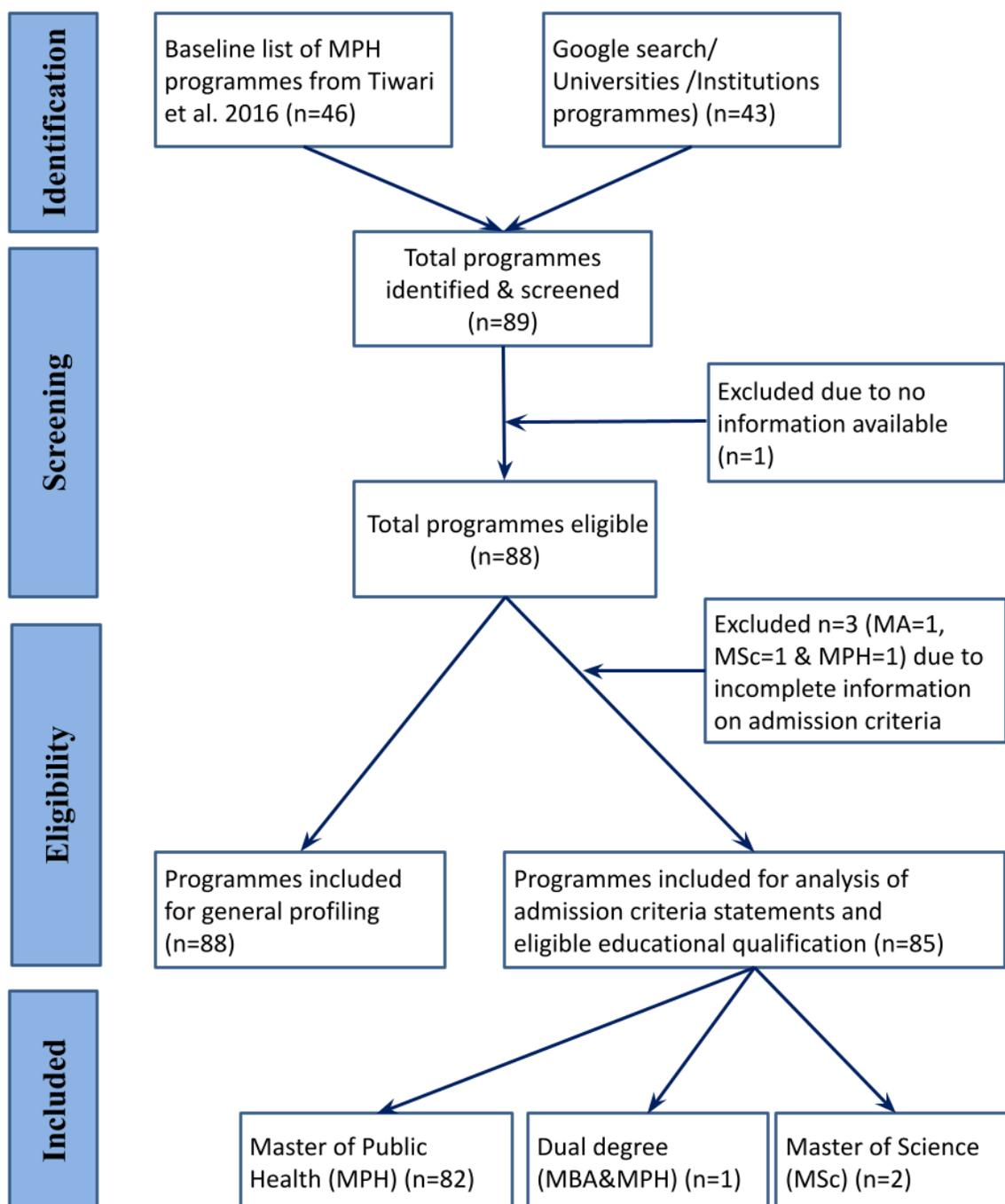
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