

Scoping the Path to Leadership in Health Research in India

STUDY REPORT



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PREFACE

The country has been making investments for establishing research infrastructure particularly during the last two decades. At the same time, the country continues to grapple with health challenges that require contextual solutions. To meet these challenges, the country must prepare its next generation of health researchers with leadership skills.

DBT/Wellcome Trust India Alliance through its investments has been promoting transformative ideas and supporting research ecosystems in India. In 2018, INCLEN received funding from the Wellcome Trust (London, UK) to better understand the contextual challenges of achieving leadership in health research taking in to cognizance of the wider societal research ecosystem.

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LIST OF ABBREVIATIONS

AESA	The Alliance for Accelerating Excellence in Science in Africa
CCT	Central Coordinating Team
CSIR	Council of Scientific and Industrial Research
DBT	Department of Biotechnology
DST	Department of Science and Technology
HIC	High Income Country
HR	Human Resource
HRD	Human Resource Department
IA	India Alliance
ICMR	Indian Council of Medical Research
IDI	In-depth interview
IIEC	Independent Institutional Ethics Committee
INCLEN	International Clinical Epidemiology Network
IP	Intellectual Property
IQDAS	INCLEN Qualitative Data Analysis Software
IT	Information Technology
LAMP	Leadership and Management Program
MHRD	Ministry of Human Resource Development
MOHFW-DHR	Ministry of Health and Family Welfare- Department of Health Research
MoU	Memorandum of Understanding
NE	North-East
NFI	Non-formal interaction
NIRF	National Institutional Ranking Framework
NMA	National Medical Authority
PMT	Project Management Team
RFA	Request for Application
RFP	Request for Proposal
STATA	Software for Statistical and Data Science
TAG	Technical Advisory Group
UGC	University Grants Commission
USP	Unique Selling Proposition
WP	Work Package

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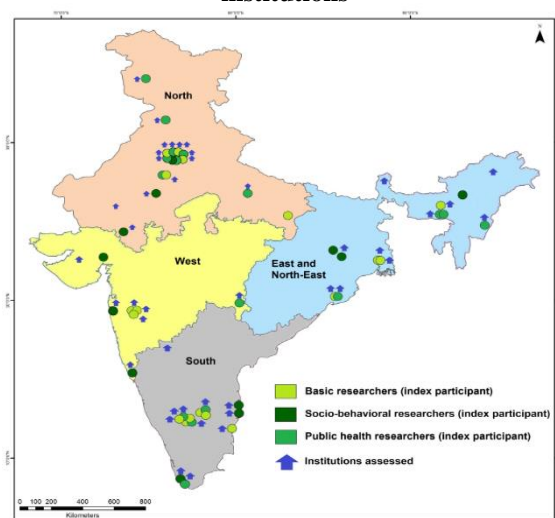
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EXECUTIVE SUMMARY

BACKGROUND & OBJECTIVES

Impactful research and transformative innovation by Indian scientists will be important to propel India to its rightful place in the comity of nations. Career paths of health researchers in India, strategies adopted by them to overcome challenges at different career stages and their skills for leveraging available institutional micro-environment and societal context have many lessons for the younger generation, institutional leadership, policymakers and funding agencies. Leaders from basic sciences, public health, and behavioural sciences were enquired of how and what made them valuable scientific research leaders and analyse the environmental and contextual contributions in their success. Landscaping of presently operational health research and service leadership training programs across India was done to determine the gaps and refine the leadership curriculum for Indian contexts.

Fig A. Location of index participants and institutions



METHODS

The Technical Advisory Group (TAG) helped in identifying 47 index participants (acknowledged as ‘leaders in health research’), located in 39 institutions spread across 17 states and two union territories. (Fig. A) The research team also spoke to 187 colleagues of these participants, and 43 institutional heads or the officers-in-charge of research in institutions that hosted these leaders. Six eminent researchers based in the Global North with collaborative research experience in India were also interviewed.

OBSERVATION

The data showed that leadership is a continuously evolving journey and not a destination. Majorly qualitative data was used to inductively develop two conceptual models that were finalised after a respondent validation workshop. The two models were 1) initial life experience based ‘*Path to Leadership*’ that contributed to the maturation of core characteristics; and 2) the ‘*Contextual Framework for Leadership in Health Research*’ which portrays the blossoming of a researcher into a leader, by leveraging the context-specific skills when placed into the soil of a research-friendly ecosystem. The two models were to be viewed as a continuum in the life cycle of a potential leader.

The Path to Research Leadership in India (Figure B)

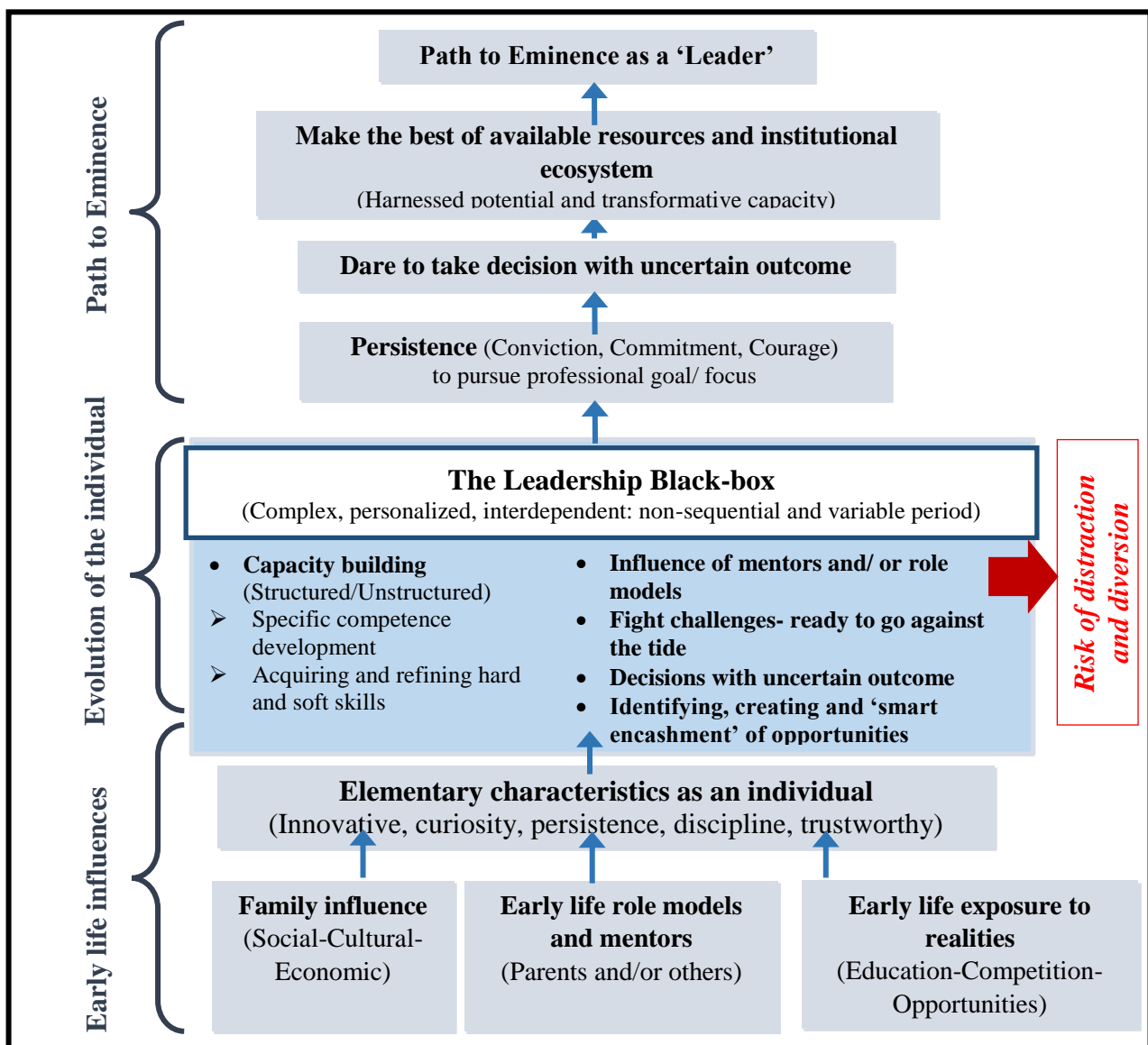
The path to leadership was not linear; several milestones and events during early life and career, shaped the path of leaders. Every index participant shared highly individualized and variant experiences, especially during their formative years. The path to leadership could be summarized broadly into three phases of life. Early life influences included the impact of family members, initial role models and mentors in the background of the social, cultural, and economic milieu of their homes. These individuals demonstrated distinctive personal attributes of innovation and curiosity, hard work, persistence, and a disciplined approach to life.

Evolution of individuals towards leadership – ‘the leadership black box’: The data clearly showed that every index participant was exposed to real-life challenges: competition, limitation of doing what they desired, unmet expectations of support from their surroundings and the general social-cultural-economic &

political ecosystem. Their experiences were varied, personalized and could not be summarized into a common coherent structure or framework. And therefore, we termed this phase as *'leadership black-box'*. Common characteristics of potential leaders that emerged during this phase were - their knack of identifying and creating opportunities and thereafter their *'smart encashment'* with persistence and focus to propel themselves on to leadership trajectory. Index participants were frequently set 'against the tide' but dared to take decisions despite no support and uncertain/unknown outcomes. The leaders cited examples of several of their bright peers getting distracted and losing path to eminence due to unknown factors during this phase of their life.

Path to eminence: Almost all the index participants indicated that somewhere along their path of initial exposures and/or 'black-box phase', they discovered a sense of purpose towards their professional lives and focussed on few specific areas. This often set them on path to eminence as research leaders. The index participants searched around for institutions with research friendly ecosystems, but also made best of the available resources without being grouchy. Almost all were keen to constantly enhance their competencies.

Fig. B: Inductively derived model path to research leadership

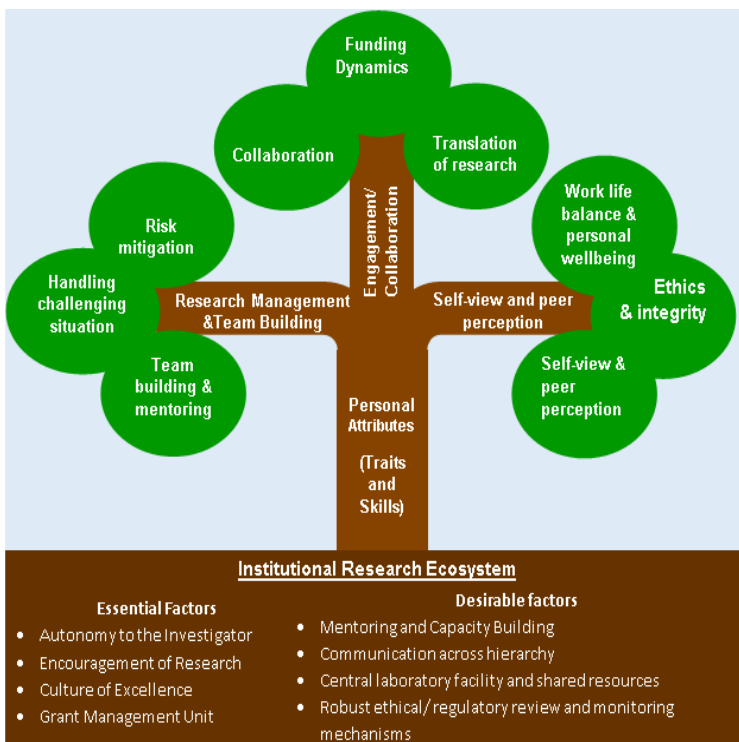


The inductively derived contextual framework for leadership in health research in India (Figure C)

Data showed that Indian research leadership required four dimensions: (1) personal traits and competence; (2) research management skills and ability to build strong teams; (3) self-awareness and work-life balance;

and (4) engagement and advocacy within and outside the host institutions. Leadership characteristics were complexly inter-related and likely to have positive as well as negative influences on each other in different contexts. A research leadership tree was conceptualized that bore fruit in research facilitating the institutional ecosystem (Figure C). Research friendly institutional ecosystems significantly influenced the challenges to blossom the leadership potential of the individuals. The essential features of a research-friendly institutional ecosystem are (1) intellectual freedom; (2) culture of excellence and healthy competition among peers; (3) research considered as a value addition for individuals and institutions; and (4) presence of a functional grant management office in the institution. Lack of a functional research grant management system has been a consistent gap across institutions in India.

Fig. C: Inductively derived contextual framework for leadership in health research in India



Due to the poor research ecosystem in North East and Central India, research leadership emerged infrequently from these regions of the country. The research leaders evolved and attained a wide range of soft and hard skills through sustained efforts. All had high emotional intelligence, aligned with the social and cultural context of the institution. However, the path to leadership was never perceived to be smooth. Researchers faced challenges in almost every facet of their evolution as leaders. Each had an individual approach towards operating within his/her team, collaborating, engaging, and negotiating with different stakeholders within and outside the institution. The research also brought forward that not infrequently questions were raised about one's technical competence and team management, their focus on awards and self-recognition, contribution to

institutional growth, a habit of over-shadowing the students and team; occasionally aspersions were also cast on their integrity and adherence to ethics. Notwithstanding these challenges, the 'leaders' continued to produce high-quality research, inspired students and younger colleagues and influenced their institutional research ecosystem.

Health Research Leadership Training Programs in India: The exercise identified and analysed 20 leadership training programs – 08 targeted at health researchers and 12 at health service providers/managers. None of the training programs comprehensively captured all the domains shown in the inductively derived model of this study. The importance of institutional research ecosystem components was missing from all the courses. The exercise revealed imperatives of drawing a contextually relevant curriculum for the leadership training programs in the country.

CONCLUSION

Indian scientists have demonstrated leadership and remained scientifically and socially relevant in spite of resource constraints, non-availability of the desired institutional research ecosystems, challenges faced at different career stages, and often with no formal leadership training. Currently available health research and service provider leadership programs in India need an overhaul of the curriculum to make these relevant to the context and accelerate the process of building next generation of bio-medical scientific leadership.

RECOMMENDATIONS

1. Establish an ‘ease of doing research’ ecosystem at all levels

Policy: Advocate with different ministries (Department of Health Research, Indian Council of Medical Research, Department of Biotechnology, Department of Science and Technology, Council of Scientific and Industrial Research, Ministry of Human Resource Development) and donors (national & international) for prioritizing investment to establish research friendly ecosystem. Investments should also address the existing regional and state asymmetries.

- Regulatory authorities e.g. National Medical Authority (NMA), University Grants Commission (UGC), and Departments within the Ministry of Science & Technology should ensure establishment of enabling research ecosystems.
- Support establishment of functional research grant management systems in health universities, medical colleges and research institutions.
- Sensitization of principals, directors, vice chancellors and other institutional leadership across the country to value research in their institutions, encourage intellectual freedom and inculcate a culture of excellence for healthy internal competition.
- Support research leadership training programs

2. Restructured & contextualized research leadership training programs for Indian bio-medical scientists:

An outline of the draft contextualized curriculum for leadership training (3-day short & 10-day long duration) is proposed addressing the domains of the inductively derived conceptual framework of the research leadership in India.

1. INTRODUCTION

Leaders are high-functioning influencers. In science, it is critical for researchers to have leadership skills to push capacity, performance and vision beyond contemporary academic traditions(1). They have to foster a culture of innovation, and portend impact within and beyond their domain of expertise and for wider societal good (2). Evolution of leadership in resource constraint low and middle income countries varies significantly from that in high income countries. The ‘path to leadership’ in developing world ecosystems is strongly context-embedded, situation-driven and determined by the research culture which might also be defined to a large extent by the leaders themselves (3)(4). The existing evidence most of which is from developed countries therefore may not be fully applicable to the developing contexts. Little is known about the dimensions of the environment in resource constrained settings and that support progress of individuals as leaders!(5).

World-wide, the need for undergoing leadership training by researchers at various career has been emphasized repeatedly so that researchers endowed with potential to become leaders, are able to tap into their best of capacities while identifying and countering their weaknesses (3, 4). Organizations and universities are yet to figure out how such programs could be best aligned and rationalized for culture and context relevance and be delivered in the most effective way (8, 9).

In March 2018, Wellcome Trust, London (Wellcome), working alongside Department of Biotechnology (DBT)- India Alliance (IA) and the Alliance for African Academy of Sciences, came up with a request for proposal (RFP) for scoping the path to health research leadership in India and Africa. The purpose of the RFP was to generate evidence and identify determinants that succeeded in creating vibrant researchers despite challenges, and elements of leadership training programs that have the potential to accelerate innovations and discovery in low and middle income countries. The INCLEN Trust International (INCLEN) was awarded the study for the Indian component. The study addressed leadership issue in three health research themes i.e., basic science (fundamental or bench research), socio-behavioural health (related to ‘human motivation, activities, psychological processes and interactions’ eventually affecting health condition of people; related to social determinants) and public health (health of population as a whole including disease epidemiology and health policy and systems studies, involving direct measurement of health and its biological determinants).

Objectives

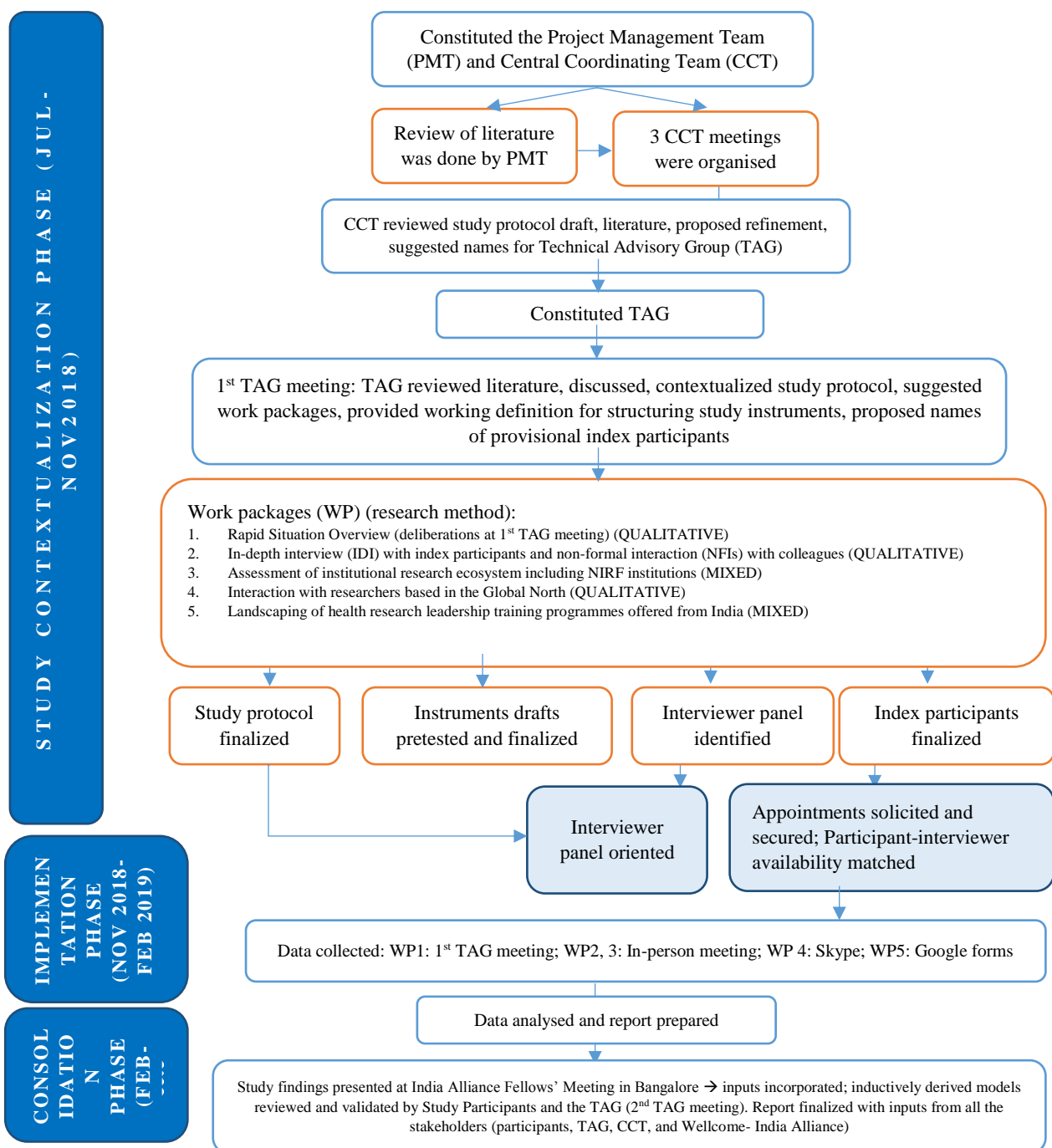
The objectives of the study were:

- Identify important health research leaders from across India working in basic science, socio-behavioural and public health and determine:
 - a. The characteristics that make them a valuable leader;
 - b. Their path to leadership
 - c. How their environment/context has influenced and shaped their path
- Define and identify the portfolio of skills (both hard and soft) required to be a successful research leader
- Landscape analysis of existing health and health research leadership trainings across India for their curriculum and contextual relevance based on the findings from the current study
- Determine the interests and scope of potential investment in comprehensive leadership training for bio-medical researchers:
 - a. From Indian science ministries, donor agencies and philanthropies
 - b. Global organisations

2. METHODS

The study was divided into three phases i.e., study contextualization, implementation and consolidation. Fig. 1 provides a flow-diagram of the scheme of activities undertaken for the study.

Fig1. Study flow diagram with timelines



2.1 Study Contextualization Phase

Study design and setting: This study was conducted between May 2018 and September 2019 using mixed methods of research (majorly qualitative as in-depth interviews (IDIs) and cross-sectional quantitative data collection for the institutional assessments). Three governance structures were established to execute the study.

- a. **The Project Management Team (PMT)** (n-7) was stationed at the Executive Office of INCLLEN, New Delhi. The team was led by PI, three co-investigators (with backgrounds of community medicine public health management, and pharmaco-epidemiology) and three research personnel
- b. **The Central Coordinating Team (CCT)** was formed with the collaborating investigators (n-13) and members in the PMT. The investigators represented the three themes (basic science, socio-behavioural science, and public health), and management faculty.
- c. **41-member Technical Advisory Group (TAG)** was constituted with 28 invited experts and the collaborating investigators (n-13). It was co-chaired by two senior-most researchers (the formerly Director-General of India Council of Medical Research (ICMR), and the formerly Chairman of University Grants Commission, Ministry of Human Resource Development, Government of India). It included senior representatives from ICMR headquarters (n-2), Indian Council of Social Science Research Headquarters (n-1), Government of India (Ministry of Health and Family Welfare (n-1); Ministry of Science and Technology (n-1), international organizations (n-3), the Wellcome Trust-India Alliance and INCLLEN (n-1 each).

Work Packages: To accomplish the objectives, the study had five work packages (WP):

WP#1 Rapid situation overview: A structured search for literature was undertaken by the PMT in July 2018 on PubMed, Google Scholar, Scopus and grey literature. Publications between January 2000 and June 2018 were retrieved; 37 full-text articles were short listed and summarized. The literature was synthesized as Integrative Review (10) combining both qualitative and quantitative findings. The findings were presented to TAG. TAG endorsed holding non-formal interaction with colleagues of index participants to explore peer perception. The TAG also developed a provisional list of research scientists in three thematic domains from across the country without applying *a priori definition* and who in their perception were established, mid or early career (emerging) leaders on the Indian health research horizon. The participant list was expanded by adding names from the lists of Wellcome-DBT-IA fellows, Fellows of the Indian National Science Academy (INSA) and *Shanti Swarup Bhatnagar* awardees (considered as the highest scientific honour in India). The final list of participants belonged to four age categories (<45; 45-55; 55-65 and ≥65 years), four geographic zones (North, South, East and North-East, and West India) based on their work-life location) and had maximum of two participants from any institution.

WP#2 Interview with index participants and non-formal interaction (NFI) with their colleagues: All participants were contacted in person for in-depth interview (IDI) and consent was obtained prior to starting the interview. The team also held non-formal interaction (NFI) with up to five colleagues (head of the institution, both senior and junior colleagues of the department, and at least one colleague from another department) of the index participants in the institution wherein s/he did career's most impactful work. The purpose was to obtain peer perception about the research leaders.

WP#3 Assessment of institutional research ecosystems: The index participant was requested to identify the name of the Indian institution wherein he/she perceived to have undertaken most impactful research. For research environmental assessments, the institutional head, dean (research) or the member secretary of the institutional ethics committee was interviewed (IDI). The quantitative information about the grant system, research facilities, and institutional policies for time protection, encouragement to attend the meetings, travel, and importance accorded to research activities in general and annual performance review was obtained. Additionally, we undertook random selection (stratified according to geographic location) of six institutions from the list of medical institutions ranked between 26th and 101st in 2018 by the National Institutional Ranking Framework (NIRF) of the Ministry of Human Resource Development (MHRD)(11);

this indicated their low research output. We shortlisted only those institutions that had been in existence before 2000 and none of the index participants were from these institutions.

WP#4 Interaction with researchers based in the high income countries (Global North): Seven researchers (basic science-2, socio-behavioural-2 and public health-3; 4 of these were Indian diaspora) with collaborative research experience in India. The purpose was to obtain their perceptions and experiences with research collaborations with Indian researchers and about bio-medical research ecosystem in India.

WP#5 Landscaping of health research leadership training programmes offered from India: TAG suggested to include both health care provider and research leadership programs for landscaping exercise. The team undertook the landscaping exercise for programs active within the past five years. Details of this exercise have been provided as a separate report.

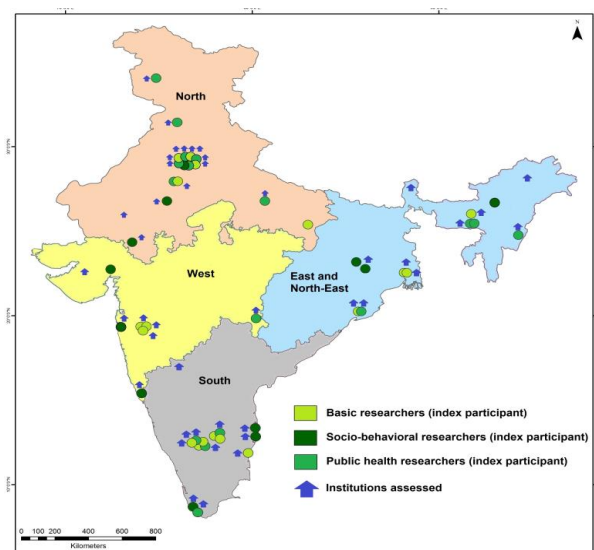
Ethics considerations: The study protocol was reviewed and approved by the INCLIN Independent Ethics Committee (IIEC 054 dated 17th October 2018). The study was conducted in compliance to the Indian Council of Medical Research National Ethical Guidelines involving Biomedical and Health Research involving Human Participants (2017). Informed written consent was obtained from participants for a) participation in the study, b) audio-recording the interaction, and c) for presentation of the study findings as anonymized case studies.

2.2 Implementation phase

Designing and administration of the study instruments: The qualitative instruments for the study were designed by referring to the integrative review of literature, the discussions during the TAG meeting and the tool the INCLIN team had used in one of its previous studies to assess the research capacity and motivation for maternal and child health in Indian institutions (the IndiaCLEN Capacity Building And Institutional Strengthening Initiative) (12) We decided to adopt grounded theory (13) to inductively develop leadership framework applicable to resource constraint settings. The draft interview schedules for the index participant and the institutional assessments were finalized over three rounds of pretesting with six participants from three institutions in Delhi. The final IDI schedule for the index participants had 29 items (Annexure IA); the institutional assessment tool had two parts – a 14-item IDI schedule and a 43-item quantitative checklist (Annexure IB). The median time for IDI with the index participant was 119 minutes (range: 59-261 minutes) and that for the institutional assessment (including self-administration of the quantitative checklist) was 40 minutes (range: 19-107 minutes). All IDIs were tape recorded. Non-formal interactions with peers were done based on a check list (9-item); none of these were recorded (Annexure IC).

Body language: The group felt that the participants may not be upfront while narrating experiences of potential displeasure and embarrassment and hence decided to capture body cues. Four items of the IDI for index participant and the NFIs with peers where the team felt the respondents will not be comfortable giving their perceptions. When these items of IDI were administered, the interviewer was advised to record body cues on following aspects: *eye contact* (only one response: overtly intense gaze/ just right/ avoiding occasionally/ avoiding most of the time); *tone of voice* (multiple responses: warmth, confidence, interested-trained); *posture & gesture* (only one possible: relaxed (body-shoulders) / stiff and immobile (folded arms, body turned away)); *intensity* (only one response: cool-flat / disinterested/ over

Fig 2. Location of index participants and institutions



the top- dramatic); and a *summative remark* (multiple possible: comfortable or uncomfortable, enthusiastic or defensive). Summative remarks on body language were recorded for NFIs.

The interviewers' panel: A panel of 40 faculty members (from 30 institutions) were identified for the study. A one-day orientation workshop was held at Delhi on 21st November 2018 to apprise them about the study objectives and methods, and oriented to interviewing techniques particularly for IDIs methods.

Participants-research leaders (Table 1): Of the initial list of 52 (basic science – 19; socio behavioural – 14; public health – 19) prospective participants, 47 consented to participate (90.4% participation rate) in the study. Reasons for non-participation were: no reasons cited-1; pre-commitments-2; study did not pertain to his area of work-1; and uncomfortable with the study methods (NFIs with colleagues)-1. Participants hailed from across the country (17 out of the 29 states and 2 of the 6 union-territories) (Fig. 2).

Preparation for the data collection: Face-to-face interview with every index participant was undertaken with prior appointment. A panel of two interviewers-each from a different institution, and from a city other than where the index participant was located administered the IDI. The PMT shared available details about the participants with the interview panels before the interview.

Data collection: Profile of the index participants in the study are summarized in Table 1.

Variable	n (%)			
	Basic Science (n=18)	Socio-behavioural (n=11)	Public Health (n=18)	Total (n=47)
No. of female index participants	4 (22.2)	5 (45.5)	2 (11.1)	11 (23.4)
No. of male index participants		6 (54.5)	16 (88.9)	36 (76.6)
Age categories (in years)	14 (77.8)			
<45	4 (22.2)	0 (0.0)	2 (11.1)	06 (12.8)
45-54	2 (11.1)	1 (9.1)	5 (27.8)	08 (17.0)
55-64	6 (33.3)	7 (63.6)	6 (33.3)	19 (40.4)
≥65		3 (27.3)	5 (27.8)	14 (29.8)
Geographic distribution	6 (33.3)			
North	5 (27.8)	3 (27.3)	8 (44.4)	16 (34.0)
South	6 (33.3)	9 (81.8)	4 (22.2)	13 (27.7)
West	3 (16.7)	2 (18.2)	2 (11.1)	07 (14.9)
East & North-East	4 (22.2)	3 (27.3)	4 (22.2)	11 (23.4)
Position/ Designation				
Professor and above	14 (77.8)	07 (63.6)	12 (66.7)	33 (70.2)
Associate / Assistant Professor	03 (16.7)	01 (09.1)	01 (05.6)	05 (10.6)
Non-teaching researchers	01 (05.6)	03 (27.3)	05 (27.8)	09 (19.1)
Publications (as listed on Scopus) (median)				
Citations	2994.5	569	1951.5	2119
<i>h</i> -index	29	13	21	20

The participants for NFI were identified by the visiting team of interviewers impromptu once it visited the index participant's attributed institution. Four institutions were located in different cities where the index participants were interviewed. In all 187 NFIs were conducted (Table 2). Of the seven Global North based researchers, one did not respond (Indian diasporas; socio-behavioural theme). We approached six lower NIRF-ranked institutes; only four institutional representatives

Summary	Profile of the index participant			
	Basic Science (n=18)	Socio-behavioural (n=11)	Public Health (n=18)	Total (n=47)
Profile of the respondent for the NFIs				
Head of the Department	6	1	6	13
Departmental colleagues	47	26	43	116
Inter-departmental collaborator	10	6	14	30
Institution Head (Dean/ Principal/ VC)	9	6	13	28
Number of NFIs conducted				
Total	72	39	76	187
Median (min, max)/index participants	4 (3,5)	3 (2,5)	4.5 (3,6)	4 (2,6)

consented to be interviewed. These interactions were conducted over Skype and recorded with prior permission. The landscaping exercise identified 20 training programmes (8 programs for health researchers and 12 for healthcare managers).

2.3 Consolidation phase

Data management, quality check and analysis:

Qualitative data analysis: The audio recordings were transcribed verbatim by a professional agency in Delhi; 100% of the transcripts were matched with audio recording by the research staff at INCLIN office. Quality checked transcribed data was entered into the INCLIN Qualitative Data Analysis Software (IQDAS): free-listed, axially coded and selective codes were developed inductively using the grounded theory approach.(13) Axial codes emerged while looking for the linkages between free listed responses and small units. Still broader domains were identified by grouping the axial codes which were connected or related to each other (selective codes). The axial and selective codes were cross-checked for appropriateness and consistency by the senior researcher to ensure consistency in interpretation and reliability. The purpose was to have high inter-coder reliability for the whole data analysis. The relevant/important statements or quotes were marked for use in the report as ‘Quotable-Quotes’.

Preparation of cross tabulations: Software helped in smooth organization of responses and preparation of stand-alone cross tabulations and that between questions having similar codes. The emerging themes were looked for similarities and differences across questions and this helped in interpretation of responses under related and unrelated domains. The results were summarised with semi-quantitative expressions (Table 3).

Proportion of Respondents (%)	Qualifiers Used	Adjectives Used
< 10	<1+	Very few
10 – 24	1+	Some
25 – 49	2+	Approximately half
50 – 75	3+	Majority
76 – 89	4+	Most
> 90	5+	Almost all

Quantitative data: The quantitative data was entered into MS Excel 2017 spreadsheets and analysed as frequency and proportions using STATA v.12. Wherever applicable, statistical significance was tested at 5% (10% for comparison between institutions due to small group sizes) probability level using Fisher’s exact test.

2.4 Respondent validation workshop

Fourteen index participants were invited to participate in a day-long ‘respondent validation workshop’ held at New Delhi on 28th July 2019. They were selected from across India, age categories, gender and thematic expertise. The workshop was conducted in conjunction with the 2nd TAG Meeting. The goal was to gain in-depth understanding using a thoroughly grounded interpretive approach. To avoid/minimize the biases due to researcher’s account of the phenomenon over-riding the participants’ perspective, the inductively derived model was reviewed and validated by the workshop attendees. The index participants (respondents) and TAG members, made critical observations and suggestions that helped to refine the model.

3. RESULTS

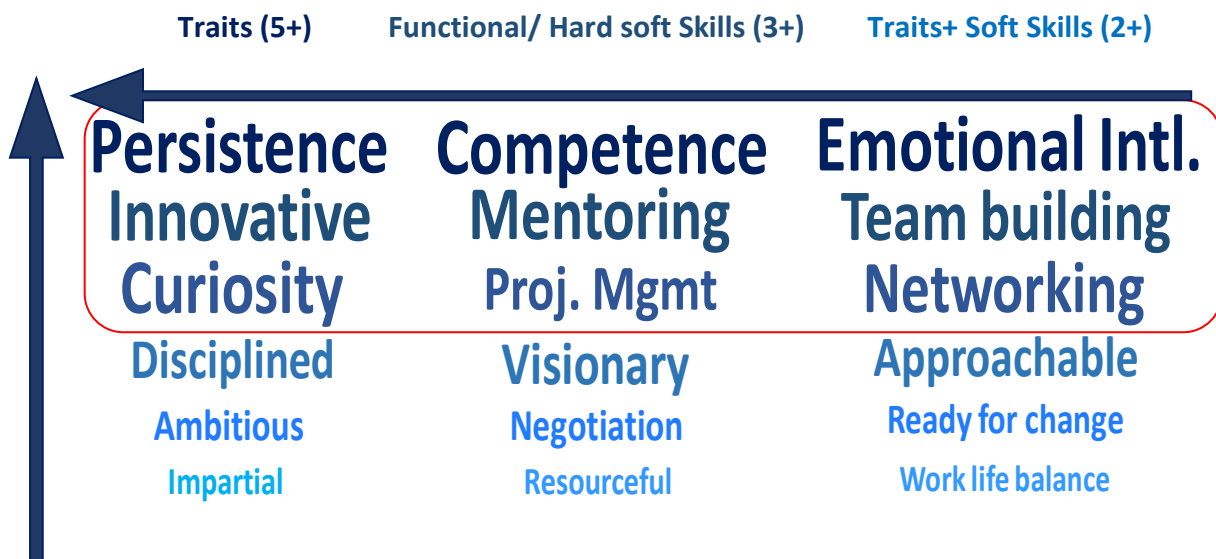
“You need to be a whole person to succeed in research.”

3.1 Personal attributes of index participants

3.1.1 Traits and skills

Almost all the index participants acknowledged that personal traits (5+) were pivotal for them to take up research as their careers, followed by the acquisition of soft skills (3+), functional & hard-soft skills (4+) over time. (Fig. 3). Majority (3+) of the index participants, perceived themselves to be passionate and persistent in whatever they undertook and had the ability to finish the work in hand. They were hard working, resilient, curious and innovative (2+) in their approach towards attainment of knowledge in general and science specifically. Most (4+) research leaders had high emotional intelligence and were keen on mentoring the next generation of leaders. Openness to new ideas and taking the initiative to venture into unique and relatively ‘unknown and uncertain territories’ were qualities that helped the index participants to take steps towards eminence. The index leaders in general were good (3+) at collaborating and forming linkages with relevant stakeholders, frequently well at negotiations; attributed these achievements to approachability, exceptional social awareness and team building skills.

Fig 3. Leadership traits and skills



3.1.2 Path to leadership: Factors influencing evolution as a researcher

Family and Early Life: The family, socio-economic, cultural and initial educational background of the index participants were acknowledged as influential factors in shaping their perspective towards society and science and inclined them towards pursuing a career in research. The participants were sometimes inspired to undertake research in the domains that addressed the environment or surroundings in which they grew up. Resource constrained environment posed its own challenges, but the index participants appeared to be undeterred by these in pursuance of their dreams. Their capability to deal with uncertainty and courage to take decisions even under these circumstances was a consistent

feature from their childhood to attaining positions of eminence. Many perceived their evolution as researchers of repute to be serendipitous.

“You will find that those who are dull in their mind, who are not curious enough, for them opportunity is there but they don’t seem to see opportunity. It is the curious person, who see opportunity because he is asking questions and he is looking for ways and means..... So, I think curiosity is the base.”

Exposures to Reality: As youngsters, these individuals soon realized the challenges in achieving what they wanted, be it the support of their parents and families, the education, the desired institution or financial constraints. Their perseverance enabled them to come up with innovative and pioneering solutions to the questions they sought answers for. Index participants were ready to go against the tide and worked hard to look for opportunities and often succeeded even in creating opportunities. They have the knack of ‘*smart encashment*’ of the opportunities coming their way.

“I was able to get that big picture right from the beginning.”

“I cannot exactly recollect but I should say that going for conferences, meeting people, stalwarts in the field of research and medical science, I think that is something that influenced me to take up research.”

Role models and mentors: Majority (4+) of the participants emphasized that role models and mentors significantly influenced their evolution through various stages of their career. During their early years, parents, family members, schoolteachers, or others were considered as role models. As they grew, many had new mentors and role models who were more aligned with science and research. They were attracted by the commitment, passion for research, competence, innovation and creativity in their role models and appreciated such qualities in them. Index participants (2+) also expected their role models to be mentors who guided their students in their career. There were, however, some (1+) index participants who denied having role of any mentor or role model in their lives.

“Having a good mentorship or mentors in life is really important in evolution process as a scientist.”

“I would say multiple mentorship is better.”

“So, I don’t have a hero, in that sense that everything they did was wonderful.....So, this hero worship stuff is very uncomfortable for me. I don’t like it. Facets of them. I don’t think there is a perfect human being”

Competence and skill acquisition: Index participants were constantly on the lookout for the opportunities to enhance their educational profile and technical skills. This was a constant highlight at various stages of career progression: attending training workshops for keeping up to date in technology and research methodology, fellowships, national & international conferences. Almost half of the index participants had spent variable time in international institutions before settling down in Indian institutions.

“My biggest strength is a wide repertoire of skills”

Attaining sense of purpose & immersion in focused area of research: Most of the index participants early on in their journey found a sense of purpose for their lives. Most of them could not articulate clearly how and when this happened. Importantly every index participant had their personalized experiences, timeline and phase of academic and professional careers with no clear pattern(s). Initial life experiences in the context of their innate qualities and characteristics appeared to have a role in this transition. Many participants also narrated stories of their peers who got distracted and could not sustain or attain the desired focus during this journey. Almost all index participants concentrated their research work on one or two challenges. As time passed, many participants also expanded their domain of research and chose to come out of their comfort zone to do multi-disciplinary research.

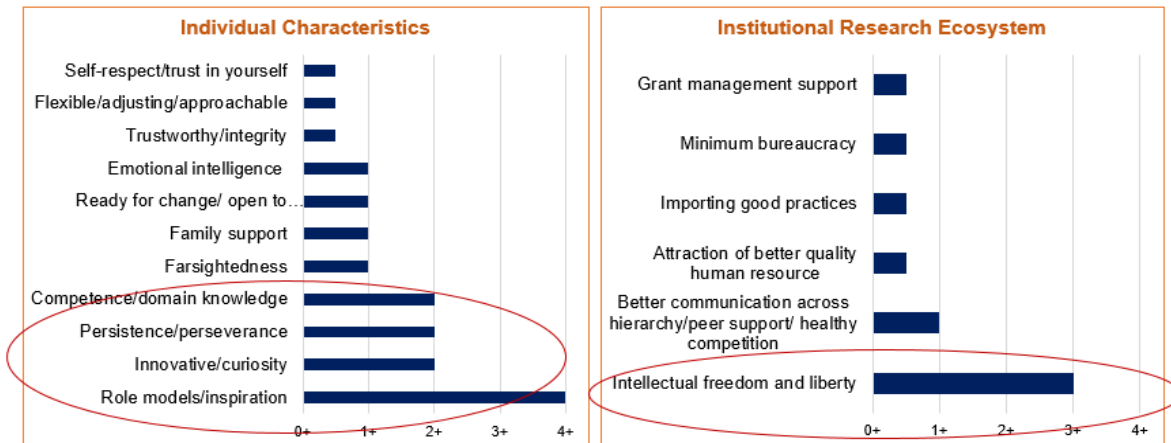
“I mean, I was in primary school, but something hit me, in the sense that subsequently I couldn’t get rid of it. And I think that drive to prove that I can do it but even better than them.”

“Try and work on our problems, rather than on rare problem. If you do even a little bit, you are recognised.”

With advancing recognition, age and administrative responsibilities, many of them were engaged in trans-disciplinary and multi-centric studies. This was boosted by peer support and the experience of working with supportive high performing teams.

“I am driven by curiosity, I don’t like being pigeon-holed in one area.”

Fig 4. Factors contributing to the evolution as a ‘researcher’ (Index participant’s perception)



3.2 Research Management and Team Building

3.2.1 Team building

Over the years, the index participants have had experiences of managing teams with heterogeneous capacity (e.g., students, scientists, and field-staff), competence, socio-economic and cultural backgrounds. They were able to build high performing teams. Majority of the index participants felt that it was necessary to put in place a mechanism for constant observation and feedback for encouragement and motivation to team members (4+). Approximately half said that there must be culture of quality (2+) in the group and some opined that exposure to outside world was important (1+) to have cohesive and high performing teams.

“You can’t build a team if you are impatient.”

Selecting the right people: The index participants preferred individuals who showed commitment to research and the willingness to learn while adapting to their team’s culture.

“It starts with good selection. You make sure you select the right staff. You select the right people and you can train them.”

Talent Spotting: Approximately half of the participants (2+) believed that they could identify students with hidden potential, personal interest, self-motivation and initiative. They said that such students put in their efforts to learn, despite challenges. Majority of index participants (3+) perceived that students who were serious about research as a career were passionate about doing good science. Almost half of the index participants (2+) also expressed that these students were intelligent, creative and had a ‘spark to excel’. They were generally single-minded, hardworking and keen to acquire new skills & knowledge. Such students have the patience to withstand the challenges of a research career.

“But they also need to be tenacious about finding answers and not giving up too fast.”

“He has carefully built the team here...each has his/her unique skill set and contributes enthusiastically.”

Encouraging and motivating the team: Encouraging open discussion and allowing academic freedom, space for disagreement and guidance rather than being prescriptive kept the team motivated. The team considered shared authorship, awards and financial rewards as efficient motivators. Fair and consistent treatment with all the team members was pointed as one of the key factors to maintain the team spirit. These strategies worked to align all the members with the team vision and work ethics. However, some of the participants suggested that ensuring a rigorous high quality research environment was their responsibility and that the team members must be self-motivated to pursue and sustain in it.

“If you work with them they get more motivated rather than just instructing them.”

Setting a culture of quality in the team: The index participants adopted multi-dimensional approach to inculcate quality in all activities. This included regular review of the performance, quality improvement interventions like handholding as required, and peer learning along with taking serious view of the breach with quality of work and data.

“I had ‘poor’ students but not ‘bad’ students.”

Monitoring and supervision: Stringent and regular monitoring and supervision (through in-group and in-person attention) and giving formal feedback were commonly mentioned by respondents.

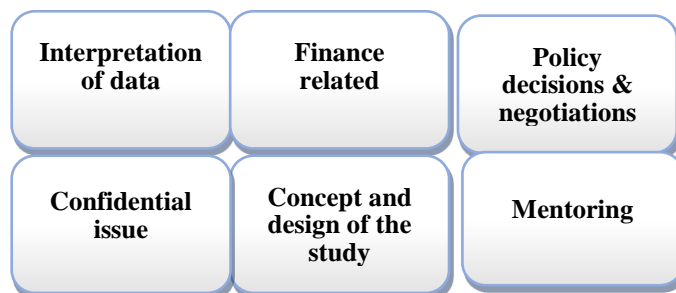
Delegation: Delegation of scientific work, administrative task and interacting with stakeholders an important strategy of mentoring and improving team efficiency. The index participants accepted that their decision to delegate task was driven by the individual traits of the team members (4+), their management skills (3+), and the type of task under consideration.(Table 4) They preferred to delegate tasks to those whom they perceived as ‘potential future leaders’.

Table 4. Characteristics looked for in the individual by the index participants while deciding on whom to delegate

Traits (4+)	Management skills (2+)
<ul style="list-style-type: none"> • Accountability • Competence & appreciation of quality • Trustworthiness • Innovativeness • Persistence • Disciplined • Ready for change • Emotional intelligence • Farsightedness 	<ul style="list-style-type: none"> • Nurturing • Negotiation • Project management skills • Ability to recognize team’s strength/ weakness • Communication skills • Time management skills

Index participants said that they delegated almost all activities but maintained a high vigil, close supervision and practiced recheck especially on matters related to ethics and finance and issues that could influence the credibility of the research group. (Fig.5)

Fig 5. Activities infrequently delegated by index participants



“Whatever I do... ultimately one thing I keep with me is the quality”

3.2.2 Mentoring

Different components of team building were considered as integral part of the mentoring process. Majority of the index participants perceived academic empowerment of the students as the first step towards encouraging them for research (3+). The students were given independent responsibilities, including lab management, along with the academic liberty to pursue their research interests, space to commit mistakes and rectify them, to prepare them as independent researchers. Mentoring was considered incomplete till a proper monitoring, audit and feedback mechanisms were in place. The participants believed that mentoring and training the students also helped in improving quality in the group, bring new and innovative ideas, and ensured the continuity of good work. The students were also advised to explore other domains of science beyond the topic of interest within the lab.

"I never think that I am just training students to just get them a PhD."

"I love working with young people and watching them grow."

The index participants opined that despite the mentor's efforts *"some (students) succeed, some don't!"* Some leaders were ready to help their students *"when they came back (to India after education abroad)"* or needed any assistance for academic guidance or professional career support (1+). While many of the peers praised the mentoring qualities of the index participants, some of them denounced the same saying that they were partial towards some of their team members, especially preferring those with powerful and effective networks.

"He did not offer equal opportunity to the entire faculty. He favoured some, especially those with strong networks"

3.2.3 Administrative capabilities

Peers perceived several traits and characteristics in the index participants. According to them, the index participants were competent (4+), functioned as change agent in the system (3+), had project management skills (3+), were institution builders (2+), farsighted (2+), served as the face of the institution (2+), and were resourceful (1+). The peers highlighted that the index participants were good at handling budgets, procurements and in staff hiring and management, and in time management (2+).

"She takes deadlines very seriously. You cannot miss a deadline with her"

"He does not waste time e.g., while travelling to the airport, he would be reading a paper or surfing or reading on the mobile and while walking to the hospital from his residence in campus, he would be reading a book."

3.2.4 Handling challenging situations

Managing emotionally charged situations in the team: Almost all (5+) the index participants admitted that they had faced emotionally charged situations in their teams. They also identified situations that could trigger such outbursts (Box 1). Majority (3+) perceived that being approachable and friendly, anticipating conflicts, refraining from giving knee-jerk reactions in heated situations, avoiding self-involvement in emotional fights between team members and delicately balancing work and personal conduct were different ways to deal emotionally charged situations.

Negotiations, matching decisions to team priorities and ensuring fairness to all concerned were some of the other strategies. The index participants (2+) used tailored communication strategies depending on

Box 1. Perception of index participants about situations which might trigger emotionally outbursts in the team

- Stress due to tight schedules and timelines
- Personal factors/ mental health of member(s)
- Conflicts (inter-personal and inter-group)
- Professional disagreements and conflict of interest
- Miscommunication due to differences in language and culture
- Perceived feeling of neglect or 'favouritism' or unfairness
- Disturbances with collaborators (e.g., unequal partnership, trust deficit)
- Breach of research ethics or professional misconduct
- Activism and politics
- Waste or scarcity of resources

the situation. The emotionally charged situations were also leveraged as mechanisms of strengthening the teams (2+) and build resilience in the ecosystem. Some of the index participants accepted that ‘everything cannot be resolved’ and during those times it was important to “let things be”.

“I am a manager of emotions”

“Distancing myself from the situation and looking at it objectively, helps a lot!”

Negotiating with higher authorities (within and outside the institution): The index participants frequently had to face situations when their research ran the risk of slowing down due to limited resources, lack of adequate equipment, shortage of space, restrictions on intellectual autonomy and limited time for research (competing clinical, teaching and administrative duties). They were occasionally pushed to conduct research beyond their core area of interest. These demanded negotiations and advocacy with different stakeholders within and outside the institution and participants generally did not shy away from pursuing these issues further (Box 2).

Box 2. Strategies adopted by index participants to negotiate with higher authorities

Repositioning self:

- Waiting for the right opportunity to put points across
- Exerting independence
- Prioritizing
- Modifying the study protocol/ study area
- Building credibility through quality research
- Aggressively looking for alternative solutions (e.g., developing inexpensive alternative kits and processes, etc.)

Effecting change through engagement, advocacy and institution building

- Being bold in voicing opinions and disagreements
- Persuading (by sharing evidence, communication)
- Raising issues in various forums or platforms
- Adopting a collective approach to problem solving by involving several faculty members
- Arguments about staff performance in different settings
- Securing membership of committees
- Building institutional structures (e.g., ethics committee, follow-up procedures)

3.2.5 Risk Mitigation

Almost all (5+) the index participants recollected that at some point of their career, they came across situations where they had to take a critical decision despite ‘uncertain’ outcome. The risk mitigation strategies adopted by them has been summarized in Boxes 3 & 4.

Box.3. Decisions that the index participants had taken despite uncertain outcome

Decision

- **Selection of specialization/ research topic** e.g., taking up an unexplored area of research, adopting upcoming research methods, changing one’s core speciality
- **Changing affiliations** e.g., shifting from a Western university to India, moving out of a ‘premier’ institution/ location to a lesser known institution/ organization/ location, changing one’s team
- **Foregoing alternative opportunities** e.g., fellowships, relocating abroad, profiteering endeavours
- **Resisting pressure to reposition one’s research stand** e.g., insistence from publishers, donors, peers
- **Entering enforced collaboration with no major role**

Risks implicated

- **Financial un-sustainability** e.g., limited job prospect, risk of being in prolonged financial distress
- **High possibility of failure/ under-achievement** e.g., research outcome unknown/ uncertain, unlikely to attain leadership position, unduly high expectation that was difficult to meet, high chance of being disliked/ losing credibility/ identity
- **Likely to feel discriminated** e.g., unequal/ inadequate credit and resource sharing, conflict of interest
- **Personal/family issues** e.g., inconvenience to family members due to relocation to less developed/ remote setting
- **Likely to find the research ecosystem at institution unfriendly** e.g., administrative hurdles and delays (bureaucracy/ complacency/ system not in place for ‘ease of doing research’/ increased need for persuasion), regulatory uncertainties, compromised quality and ethics, possibility of career damage due to unfriendly competition (jealousy, personal attacks and negativity in approach)

Box 4. Risk mitigation strategies adopted by index participants in situations where they had to take decisions despite uncertain outcome

Mitigation strategies

- ❖ **Long term planning and executing it with sustained focus (undeterred by personal attacks)**
- ❖ **Mobilizing support:** Spouse, family, institutional leadership, seniors, teachers and mentors, other stakeholders
- ❖ **Repositioning self strategically:**
 - **Taking a stand:** advocacy (strong voice, evidence-backed, at appropriate forum, targeting relevant stakeholder constituencies), refusing to compromise
 - **Adapting & resilience:** creating backup plans, prepared to working within the constraints, enduring through uncertainties and capacity to rise from the ashes, influencing the environment to make it research friendly, overcoming personal ego, working harder, acquiring new skills and capacity, building on past successes / experiences and leveraging institutional resources, not being risk averse, realigning research interest as per fund availability
 - **Quitting:** giving up opportunities, looking for alternatives
- ❖ **Committing to societal well-being:** thinking of societal relevance and larger public good, country specific prioritization of work

3.2.6 Communication and approachability

The index participants were appreciated by their peers for being emotionally intelligent (3+) and excellent communicators (2+). They were perceived as flexible, adjusting and approachable (4+).

“He is accessible to everyone. He would meet the senior faculty as well as the departmental sweeper with equal warmth.”

“She is affirmative in a positive way. If she does not agree to something, she will surely verbalize her disagreement but not to offend anyone but to communicate her point”

3.3 Research Collaboration & Engagement with stakeholders and advocacy

3.3.1. Collaboration for research

Reasons for collaboration and challenges faced: All the 47 index participants informed of collaborating for research at some point of time in their career. Reasons for collaboration cited by them have been summarized in Table 5.

• Complementarities of skills, processes and resources	• Mutual learning
• Improved quality of work	• Alignment of research interests
• Opportunity to do multi-centric studies	• Leverage interpersonal relationships
• Increase in number and quality of publications	• Develop collaborative networks & linkage (for better funding chances)
• Opportunity to work with credible researchers	• Contribute more effectively to societal good, science

“Collaboration helps you to break the boundaries.”

“A good successful administrator is that who adapts best practices of other departments of other institutions to your system.”

However, the most (4+) index participants also confessed that collaborations were not always pleasant and recounted the challenges experienced (Table 6).

“Collaboration should be to grow capacity rather than control it.”

“Irrespective of who you are in the field, if you don't bring value to the entire group, we wouldn't work with you.”

“I surely have kept away from collaborating on research with my wife.”

Themes	Sub-themes
Trust deficit/Unsure relationship (Almost Half; 2+)	<ul style="list-style-type: none"> • Commitment not kept • Professional peer jealousy • Partners not contributing and not cooperative • Lack of time and support from collaborators • Collaborators do not share raw data and consent forms • Publication without informing/ seeking permission
Not a win-win situation among collaborators/ unequal partnership (Almost Half; 2+)	<ul style="list-style-type: none"> • Superiority complex of partner collaborators • Work allocation is heavily loaded against you • Collaborators try to take more credit than they have done • Data gets used by your collaborators much more • Derogatory attitude of collaborators • Insensitive towards local people
Different scientific interest (Some; 1+)	<ul style="list-style-type: none"> • Conflict of interest • Clash of ideological views/ Difference of opinions • Non alignment of collaborative goals
Administrative Hurdles (Some; 1+)	<ul style="list-style-type: none"> • Regulatory requirements and approval and consensus • Unique & donor specific financial management and nuances
Agency relationship between collaborators /collaboration between too junior and too senior (Some; 1+)	<ul style="list-style-type: none"> • Lot of hierarchy and bureaucracy • Working in the ambit of policies of the Government, hands are tied • Collaboration controlled by partner
Differences in capacity (Some; 1+)	<ul style="list-style-type: none"> • Lack of bio banks in India • Data handling and analytic capacities • Difference in competencies of researchers • Lack of protected time for research • Remote location of the collaborators/institution
Mutual respect (Some; 1+)	<ul style="list-style-type: none"> • Faced humiliation in collaboration • Did not respect partner
Collaborators not ready to change/ collaborators trying to push unrealistic objectives (Very Few; <1+)	<ul style="list-style-type: none"> • High expectations from low resources • Unreasonable timelines • Forcing views led to compromised quality

Box 5 captures the course of action undertaken by the index participants when the collaborations ran into rough weather. Most of the respondents acknowledged the significance of mutual trust, respect and interpersonal relationship to sustain collaboration. Strategies mentioned in Box 5 were being used by several index participants as a check list while entering into any collaborative work.

Box 5. Actions undertaken by the index participants when faced with challenging collaborations

Setting and implementing clear terms of partnership: Defining and communicating roles and deliverables clearly with timelines and implementing frameworks for transparency and accountability from the beginning

Discussing and negotiating: Resolving issues through discussions and or negotiating to bring the collaborative partner on board.

Enduring and sustaining collaboration till the end of the project: Accepting unrealistic, and unfair working relationship to sustain the collaboration.

Taking a stand and prioritizing science, community’s interest and law of the land: In situations of insensitivity towards these issues, taking an uncompromising stand

Ending or not continuing the collaboration: In extreme situations, the participants decided to walk away from collaborations; putting question mark to future collaborations

Spreading the word to other stakeholders: When faced with unequal collaboration or collaborations without integrity, informed the funding agency and other national institutes or collaborators know about the unpleasant experiences.

3.3.2 Collaboration between mentors and mentees

Approximately half of the index participants had continued to collaborate with their students and/ or mentors (2+). Mostly, the mentees approached the mentor for collaborations. Such collaborations with former associates helped in expanding research horizons and had the potential of improved quality of research and make more ambitious projects (2+). The participants maintained a reciprocal relationship of respect and trust with their mentors or mentees (2+). They believed in “*treating their former students as equal*” and personal gestures further strengthened their relationships. There were however some (1+) index participants who did not want to collaborate with their mentors or mentees because: “*relationship changes*”; their domains of “*science were different from their mentors*”; collaboration with a senior, especially a scientist of repute, was perceived as difficult owing to culturally desirable ‘*guru-shishya*’ (mentor and mentee/teacher-student) relationship and possibility of being overshadowed by their senior; and because of the perception that former students must pursue science independently and establish their own identity.

“I think when they start off, I am still involved for the first couple of years but I like to distance myself from students and specially students in academia very soon so they are more independent.”

3.3.3: Perceptions of researchers based in the Global North (high income countries) about research collaboration in India

Perception about Indian investigators: Index participants from the Global North understood the cultural differences between them and the Indian researchers, accordingly handled their Indian collaborators. The investigators from developed countries were generally eager to work with Indian scientists due to prevailing academic standards in India, hardworking nature and ease of communication with Indian counterparts. Past experience of collaboration and reputation of Indian scientists were vital in choosing partners in India. Researchers from the Global North perceived that advanced training, high quality publications, competency levels for the particular project, and high social awareness were some of the attributes of their Indian partners for initiating and pursuing successful collaborative research. One of the international researchers also emphasized the importance of soft skills of the potential partners.

“I look for excellence and complementarity.”

“I think what to me is important in collaboration is someone, who is really committed to the research”

“It is important that the investigators are able to defend their data and work when questioned, as it reflects the integrity of their work.”

“I would first make sure that the man is not drunk before I ensure whether he can drive the car.”

The HIC based researchers opined that the most reliable way to decide on the ‘worthiness’ of a collaborator was through one-to-one meetings. They also perceived Indian investigators to be “difficult to work with” particularly in concern authorship in publications. Sometimes the departmental leadership were not receptive of new ideas, and thus limited the young researchers from entering in international collaborative research.

“Advertisement never really yields very good people.”

“I would mostly rely on older collaborators, previous collaborators and not develop new relationship.”

“There is a fairly strong contrarian streak to Indian scientists and academics that sometimes, they take a negative tone.”

When the initiatives for collaboration was from the Indian investigators/ scientists, similar characteristics were sought for from their international partners.

Approaching institutions for international collaborative research: The Global North based researchers had more confidence to collaborate with institutions of repute, investigators with high credibility and their previous experience. This helped the international investigators to gain visibility and influence public policy.

Challenges in international collaboration: Getting timely approval from MOHFW-HMIS, essential requirements for the collaborating institutions to have Foreign Contribution Regulation Act (FCRA) registration and a flexible grant management with limited bureaucracy were some of the major challenges in initiating the international research collaboration. There were examples cited where memorandums of understanding were formalized but due to political change or rivalry, the entire program came to a halt leading to loss of the scientific endeavours and years invested in building trust and relationship.

“Usually Indian institutions have a very hard time, sharing data.”

Perception about young research scholars in India: The researchers from high income countries appreciated the enthusiasm, eagerness and interest for research among students in India despite huge institutional and societal bias. The participants shared their ‘rewarding’ and ‘gratifying’ experiences of working with Indian students, who were described to be extremely hard working and with a knack of acquiring new skills under their tutelage or supervision.

3.3.4. Funding dynamics

Majority (3+) of the index participants admitted that there were benefits of knowing people in the funding agencies: Acquaintance in the funding agency helped them to know areas of research with greater chances of getting funded and consequent funding. Almost half of the index participants (2+) were of the view that competence, track record and quality of science produced by a researcher were the most important. The majority (3+) of index participant, despite successfully getting the grants, faced challenges to have continuous sources of funding. (Table 7)

“Personal relationships do help. After all they see a face to the file.”

Table 7. Index participants’ viewpoints on determinants for getting funded for research in India

Reasons cited for ability to attract funds for research	Challenges faced in attracting funds
Competence of the researcher	Poor financial management/ unutilized funds
Credibility of the researchers widely known/personal recognition	Difficulty in getting competent staff
Awareness about funding agencies and their preferred areas for support	No protected time for research
Not over committing	Time lag between application and sanction/delay in getting funding
Collaboration network/supportive partners	Legal and regulatory requirement / ethical clearances
Priority setting/time management/prompt	Need for constant working and writing proposal to generate a stream of resources / time constraint
Team capacity to write grants	No awareness about funding opportunities
Institutional grant management support	Competence of reviewer and process of review
Persistence/Perseverance/commitment	Highly bureaucratic / politics of funding
Availability of funding in the areas of interest	No coordination and interaction with funding agencies
Coordination and interaction with funding agencies	No funding available for small studies /explorative studies
Unique areas of research/pioneering work	Non-availability of appropriate funding from government, competitive grants shrinking,

“I cannot give that much of time in research because teaching is the main thing I do out here. And not only teaching and there are so many other responsibilities from the institute like in committees and so.”

“Funding is less, and you need to just fight out with large number of people to get that. Yes, competition is there”

“Success is more because over time your visibility helps. And they start believing in you.”

3.3.5. Translation of research: strategies adopted to influence policies

Networking / Stakeholder engagement: Majority (3+) of the index participants felt that an effective way to influence public policies and programs was to create an informal network with peer researchers and policy makers. This helped them in becoming members of different committees or policy making bodies (e.g. institutional ethics committees, task forces, etc.). However, almost half (2+) of the index participants also felt that engagement with policy and program makers should be taken up as formal partnership and engagement with them makes the translational process early and relatively smooth.

Dissemination-Advocacy: Dissemination was considered as a powerful tool to influence policy and several channels like: publications, workshops, international & national professional meetings and conferences. Beyond academic publishing, the index participants also felt that there was a need to initiate public dialogue and to take their research to the masses. The index participants were also supported by the professional bodies to conduct public awareness programs. They used media platforms like newspapers and digital media to communicate their findings to the public and this also grabbed the attention of policy makers and society. Social media was another tool that was recently used for dissemination of key research findings and activism.

“...so there are some influential people who can change the game.”

Advocacy at policy level was considered equally important for the index participants. They would look for engaging relevant policy stakeholders including techno-bureaucracy through strategies for networking. Some of the researchers who enjoyed high esteem in scientific community both nationally and internationally were also invited to the high table at the country level for advising on policies and programs.

Majority of research leaders had kept their ‘ears’ close to the community that helped them to undertake an inclusive approach to research and generate evidence that had contextual policy and program relevance.

“There are four levels of research. The lowest... research ‘on’ the people. Then come research ‘for’ the people followed by research ‘with’ the people. The highest and most difficult one is research ‘by’ the people. This needs significant empowerment.” (Quote paraphrased)

3.4 Self-view and peer perception about leaders

According to Goleman, ‘self-awareness’ is an important virtue and people with strong self-awareness recognize how their feelings affect themselves, others in the teams and surrounding and also influence their job performance.’(16) This helps shape the overall perspective from which s/he views the world (world-view). Similarly, based on personal experiences as well as perceptions, peers and colleagues form opinions about one’s virtues and vices, and are expressed as ‘testimonials’. We attempted to explore and corroborate these through the following mechanisms:

1. Self-versus-colleagues’ viewpoints: concurrence versus disagreements
2. Response of index participants to ‘potentially unpleasant’ (research ethics, integrity) queries along with an assessment of his/ her body language
3. Exploring the way participants relatively prioritized work and other family and societal role expectations (work-life balance and personal well-being)

3.4.1 Self-view & peer-perception

The interaction with the index participants and their colleagues helped triangulate information on the traits and skills of the ‘leaders’. Furthermore, the peers also provided testimonials to the characteristics that leaders might or might not be aware of or might be undervaluing.

Legacy the research leaders would like to leave behind: Index participants placed emphasis on: mentorship and in training of the younger generation of students and faculty to (2+); they would like to be known for their research work; research quality and integrity and for their encouragement of their mentees to have intellectually independent thought processes (2+).

“Follow the scientific method and never be afraid to ask a question.”

“We never compromised or took shortcuts.”

There were others who were quite understated about their achievements and did not want to leave any legacy behind (2+). The index leaders were of the opinion that it should not be the idea of leaving a legacy, but *“passion for doing good science”* and the researchers should be inclusive but *“should not build their forts so tight that no one can enter.”*

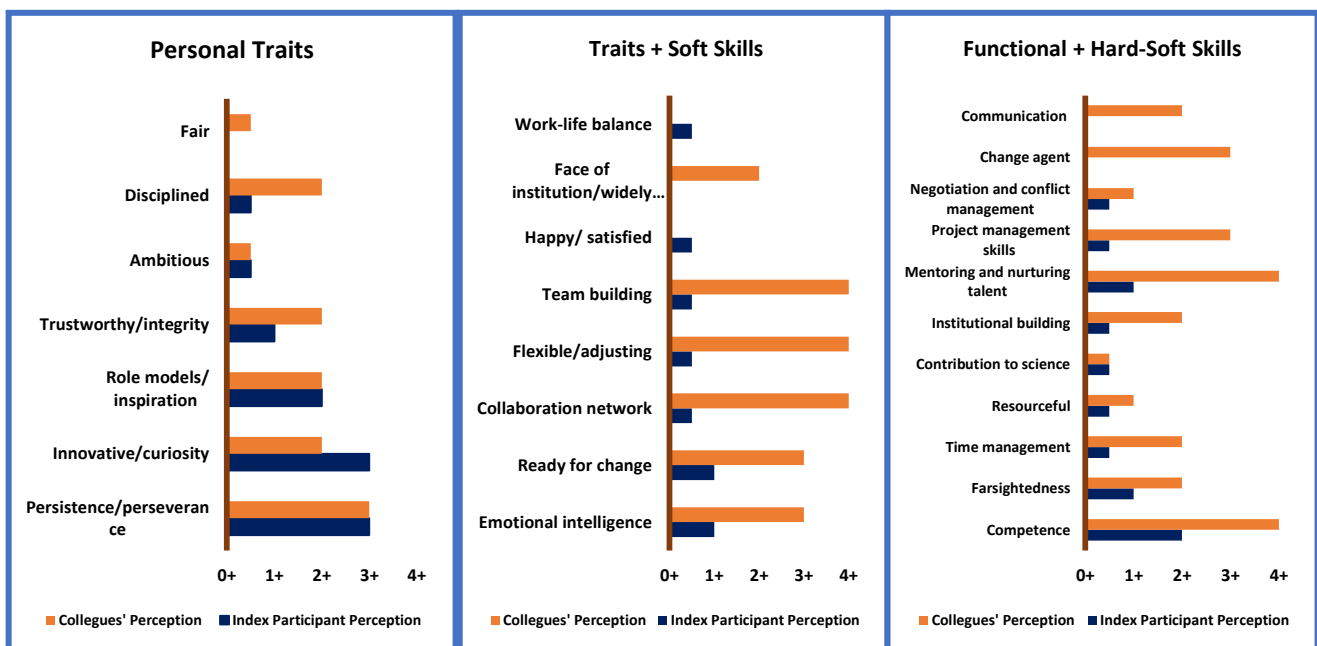
“I really am not interested on being known for anything. You do what you can, and you move on.”

The triangulation of perceptions of the index participants and their colleagues (NFIs) suggested the following hypotheses:

‘Leaders’ may not be self-aware enough about their functional skills: It was interesting to note that the index participants’ perception of themselves frequently did not match and occasionally were incongruent with what the colleagues’ opined of them (Fig 6). The alignment was the closest when it came to the traits but the divergence was appreciable for both soft and hard skills. Most of the peers (4+), had positive opinion about the core characteristics skills and quality of research of the index participants.

“He is open to arguments without being vindictive.”
“We have worked ‘with’ him and not ‘under’ him”
“He always trained the next line of people very diligently”
“She is firm and fair... very focussed... knows how to connect dots. She is known for her urge and determination”

Fig 6. Self-view and peer perception: positive view points



Colleagues may hold negative opinions about ‘leaders’: In 37 of the 187 NFIs, there was at least one adverse opinion about the index participant. This pertained to 23 of the 47 index participants (almost half; 2+). The negative opinions

“Strongly focused on awards and recognition”
“He is (also) an ‘envelope scientist’.”
“He has a low risk appetite.”
“There is no delegation of work. The strategy is to divide and rule.”
“He does not recognize brilliance in other researchers”
“He is afraid that others will demonstrate his inefficiency if they were promoted”

were related to poor management skills (4+), individual characteristics (3+), inability to influence institutional functioning (2+) and non-prominent role in institutional research ecosystem (<1+).

Table 8. Comparison of overall peer perception about the index participant according to the body language of the peer during the Non-Formal interactions (NFI)

Body language of the peer during the NFI	Overall peer perception about the index participant* n (%)			p value (Fisher's exact)
	Peers (n-94) of 23 Index participants with at least one having negative perception	Peers (n-93) of 24 Index participants with only positive perception	Overall perception (n=187)	
Comfortable	77 (81.9)	82 (88.2)	159 (85.0)	0.306
Uncomfortable	10 (10.6)	04 (04.3)	14 (07.5)	0.163
Enthusiastic	36 (38.3)	44 (47.3)	80 (42.8)	0.239
Defensive	11 (11.7)	09 (09.7)	20 (10.7)	0.814

* The peer perception was considered as 'negative' if any of the NFIs conducted for the index participant included an adverse viewpoint, and 'positive' if no adverse viewpoint was expressed for the index participant in any of the NFIs conducted for him/ her. Consequently, NFIs were adjudged as 'negative' for 23 index participants and as 'positive' for the remaining 24 index participants.

There was a general trend of less comfort and more defensive attitude among the colleagues who were describing 23 research leaders about whom at least one colleague had held negative views though the differences were not statistically significant. (Table 8). When Comfort level and or enthusiastic body language were combined, the differences were significant (p=0.039) in favor of 24 index participants about whom all the colleagues had positive perceptions. During NFIs, peers were more likely to be uncomfortable whenever they made an unfavorable (negative) remark about the index participant. (Table 9).

Table 9. Comparison of peer perception about the index participant in each non-formal interaction (NFI) with body language of the peer during the NFI

Body language	NFI Remark –n (%)			p value (Fisher's exact)
	Negative (n=37)	Positive (n=150)	Total (n=187)	
Comfortable	28 (75.7)	131 (87.3)	159 (85.0)	0.119
Uncomfortable	08 (21.6)	06 (4.0)	14 (07.5)	0.001
Enthusiastic	15 (40.5)	65 (43.3)	80 (42.8)	0.854
Defensive	06 (16.2)	14 (09.3)	20 (10.7)	0.239

3.4.2 Ethics and integrity

Almost all (5+) participants acknowledged having faced situations over their research career when they could not publish original data, someone in the team tried tampering with the data, faced undue pressure from the donors or other important stakeholders, and were questioned by colleagues or scientific body for their research integrity and technical competence. The index participants mentioned one or more of the following reasons for being unable to publish or for delayed publication: busy with other

commitments and the data becoming obsolete; dependent on students/research staff for data analysis and manuscript preparation; inability to find an appropriate journal, repeated rejections; lack of funds for publication; funder/other stakeholders not interested in publication; and suspected the quality of data.

“It's impossible to completely fabricate data. If you can do that, you must be a genius. If you're a genius, better do genuine research.”

A few incidents were narrated by the index participants where the funding agency or associated stakeholder pressurized or ‘advised’ the scientists to modify the research methods and findings e.g., asking to collaborate with unknown partners against their wish, not agreeing to publish negative results, requesting to ‘tone down’ the critical observations and occasionally ‘micromanaging’ the project.

Table 10. Experience of index participants regarding ‘research integrity’ related predicaments and preventive strategies adopted	
Data tampering by research personnel/ student	Integrity, ethics and competence questioning by colleagues/ scientific body
<p><u>Reasons for data tampering:</u></p> <p><i>Clever and over-confident students:</i> attempting short cuts; fudging data; plagiarism; mishandling reagents; ‘data stealing</p> <p><i>Unintentional:</i> poor understanding of protocol/ ethics; misinterpretation</p> <p><i>High expectations:</i> desperation to publish; unrealistic deadlines</p> <p><i>Weak oversight/ supervision mechanism</i></p> <p><u>Corrective actions taken</u></p> <p><u>Salvage strategies cited:</u></p> <p><i>Proactive quality control measures:</i> strengthened monitoring methods (e.g. self-involvement/ technology/ protocols and memo practices; surprise checks); data recheck (e.g., giving the same work to several students, repeating the experiments; maintaining high suspicion especially if the data looks ‘too good to be true’)</p> <p><i>Empathy:</i> carrot and stick policy; frequent dialogue with the team; addressing personal issues of students; realistic expectations from students; ‘zero tolerance policy’ for repeat errors;</p> <p><i>Mentoring:</i> Improving technical competence and communication skills of students/ staff</p>	<p><u>Situation/ Type of allegations faced:</u></p> <p><i>Competence questioned:</i> core subject; methods; interpretation of data; collaborators criticized capacity and quality (international; inter-institutional)</p> <p><i>Research management capabilities doubted:</i> poor quality of work; poor oversight; inability to meet milestones/ timelines</p> <p><i>Research integrity attacked:</i> unethical; breach of confidentiality; poor publication; data hiding & manipulation;</p> <p><i>Inter-personal reasons:</i> professional jealousy; unhealthy competition; fault finders; ego-clashes; differences in viewpoints</p> <p><u>Corrective actions taken</u></p> <p><i>Further honing of competence, capacities and skills</i></p> <p><i>Improved management practices and processes:</i> re-look at quality assurance and oversight mechanisms; set realistic targets & milestones (avoid over-committing); greater focussing on mentoring; empathy and emotional intelligence to address issues of team building and research management</p> <p><i>Engaged effectively with stakeholders:</i> allowed data audit; shared raw data; engaged with cynics/donors/partners to understand their viewpoint better; disengaged from the partnerships; proposed to establish ‘office of integrity’ within the institution; facilitated development of ‘collaboration’ framework</p> <p><i>Built and guarded reputation over the years:</i> Maintained high competence levels and credibility; became extremely vigilant about ethics adherence; enhanced data transparency; maintained consistently high quality</p>

“I appreciated the input and (it) probably made me evolved (and) my science better”

“If you are dealing directly with ‘X’, they can breathe down your throat. Same is the case with ‘Y’, it is a repulsive donor. People don’t like ‘Y’ because they have been here for so long and then they pump in so much money that we have to basically listen to them.”

“We don’t sweep anything into the carpet.”

“We don't have over smart colleagues working with us.”

3.4.3 Index participants’ reflections on work-life balance & personal well-being

Balancing professional and personal life: Among the index participants, only some (1+) said that they were ‘able to cope’ and maintain a work-life balance without much effort, almost half (2+) felt that they could do so only to certain extent but with continual effort, while majority (3+) admitted that they were unable to balance between their professional and family life and had, in a way, given up attempting to strike balance between the two. (Fig. 7).

“If you succeed in one, then there is a ‘non-success’ on some other fronts”

Index participants admitted that they did not socialize much and attended family functions only when these were ‘obligatory’. Almost half of the participants, expressed feeling of guilt for prioritizing work over family. They were frequently convinced that they had no time to ‘waste in building artificial networks’ and in pleasing people. For them most efficient time investment was in their research activities.

“My wife often told me that you are married to your lab and it is your second wife.”

“I had to go out of town when my wife delivered our first child. And they haven’t forgotten this.”

“I have failed. I spent all my time in the lab”.

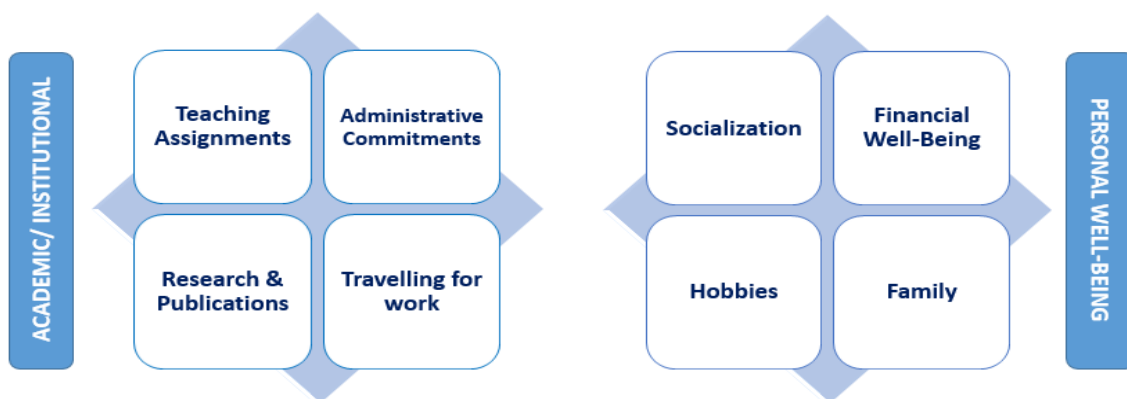
Those who could achieve balance were able to do so by restricting themselves from overdoing work, harmonizing their personal and professional lives and by keeping life ‘simple’. Among all the strategies mentioned sharing family and social responsibilities with the spouse was an important one.

“The only reason is that a real researcher will have to sacrifice a lot. The real researcher has a very unhappy family life.”

“If I have a work life balance, then my research team may not have high achievement figures. Nothing is like success. When all this comes, you can’t abandon and sit at home and take care of your family.”

More females index participants (3+) as compared to the male index participants (2+) were putting in efforts to cope with their work-life conflict and expressed the need to balance between the two; they succeeded to a large extent.

Fig 7. Opportunity cost of being a leader in research: Work-Life Balance & Personal Wellbeing’



3.4.4 Support systems reckoned by the index participants

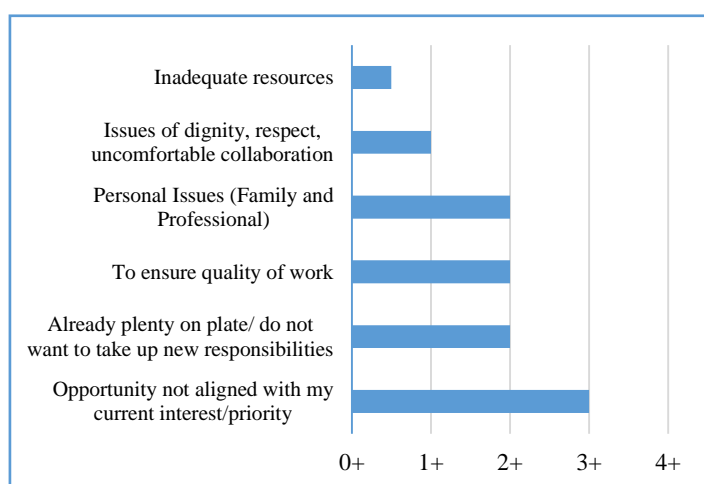
These have been summarized in Table 11 below.

Factors	Characteristics
Spouse	<ul style="list-style-type: none"> ○ Provides good domestic support ○ Better understanding if both are in the similar field/ research ○ Encouraging and motivating partner’s achievements ○ Not demanding ○ Balances the family and social front ○ Mutual respect of each other’s job ○ Contributes to family financially <p><i>“If I contributed 50%, the other 50% was contributed by my family’s sacrifice.”</i> <i>“I have twins and luckily my wife had decided not to work.”</i></p>
Family and friends (including parents & neighbours)	<ul style="list-style-type: none"> ○ Respect the work ○ Accepted their way of life ○ Come over to look after children when in need ○ Taking care of household chores ○ Take up the burden of socialization <p><i>“I had a very good support at my in-laws to be able to take care of my child and then my husband and my in-laws understand that this needs to be done.”</i></p>
Institutional System	<ul style="list-style-type: none"> ○ Strong support system in the campus ○ Living on campus makes managing things better ○ Institution is understanding when family needs to be looked after ○ Posting location in hometown and no transfer helped to manage family <p><i>“There are times when one has to spend months at a time looking after family members and institution understanding enough at that time to let me do that.”</i></p>

3.4.5 Ability to say ‘no’ to new opportunities

The index participants recognized that career prospects and opportunities seldom came their way naturally. Almost all were constantly writing new grants to keep their financial and resource status healthy. Still, most of them (4+) acknowledged that they chose to say ‘NO’ to new finding and project opportunities on several such occasions. (Fig. 8)

Fig 8. When do leaders say ‘no’ to new opportunities?



They expressed that saying ‘no’ and rejecting opportunities were necessary to focus on priorities at hand for professional growth and accomplish current responsibilities with quality and within scheduled timelines.

“If you really want to grow yourself in your profession, then I think you will have to say ‘no!’. You have to have your priorities.”

“You have to temper your curiosity and control it.”

“Even if it is payable but I find it is below my dignity, then I will not take it”

3.5 Ecosystem for research (institutional)

There was certain degree of purposive selection of 47 research leaders from across all the geographic and socio-cultural parts of the country to capture vast heterogeneity between structure, governance, and functioning of the institutions. Not more than two researchers from any one institution were selected and as a result we were able to get an in-depth understanding of the research ecosystem prevalent in 39 institutions located in 17 states and 2 union territories. We compared these institutions with the 4 other

institutions from which none of the index participants came and which had been poorly ranked by the Government of India for relatively low research output (‘controls’).

“Systems are not in place, life for researchers is not smooth in our country.”

3.5.1 Enabling factors in the institutional ecosystem of index participants

The index participants and Deans/Officers-in-charge of institutional research department mentioned several factors that were considered facilitators of creating a friendly research environment. The respondents perceived broadly two sets of attributes that would facilitate research friendly environment in the academic and research institutions: essential or necessary and desirable or sufficient factors. Details of these factors have been provided in Table 12.

“The preference and priority for selecting people, who have outstanding research records actually helps us having a better research ambience in the university setup.”

“A research conducive infrastructure in terms of manpower support and financial management support, all that needs to be specifically inclined towards research. Clubbing research management with the general administration does not make it work.”

Table 12. Attributes of a Research Friendly Ecosystem: As Perceived by Index Participants & Deans In-charge of Research	
Essential (/Necessary) factors	Desirable (Sufficient) factors
<p>Autonomy to the investigator (4+)</p> <ul style="list-style-type: none"> • Intellectual autonomy and freedom to collaborate within and outside the institution <p>Encouragement of Research (2-3+)</p> <ul style="list-style-type: none"> • Research activities valued by the peers, department and institution • Healthy competition among peers • Performance appraisal: publication, conferences and membership in scientific bodies given weightage <p>Culture of Excellence (4+)</p> <ul style="list-style-type: none"> • Emphasis on attracting/ hiring promising and meritorious staff/researchers • Encouragement on staying ahead in attracting extramural funds, & undertaking high-impact research with translation potential) <p>Grant Management units (functional & efficient) (3+ to 4+)</p> <ul style="list-style-type: none"> • Dedicated research cell for managing research grants • Research funding scanning <p>Finance Management Support</p> <ul style="list-style-type: none"> ○ Assistance to the investigator for budget preparation, funder requirements, audit ○ Ensuring compliance with government regulations <p>Admin and HR Support</p> <ul style="list-style-type: none"> ○ Purchase & HR support ○ Inter-departmental synergy ○ Legal support structures (e.g. MoU, IP, contracts) 	<p>Mentoring and Capacity Building (1-2+?)</p> <ul style="list-style-type: none"> • Mentoring of students & younger faculty encouraged and recognized • Encourage international & in-country exchange and technology/skill transfer <p>Communication across hierarchy (1+)</p> <ul style="list-style-type: none"> • Freedom to questions and offer a critique <p>Central laboratory facility and shared resources (1+)</p> <p>Robust ethical/ regulatory review and monitoring mechanisms (2+)</p> <p>Additional encouragement of research (1+)</p> <ul style="list-style-type: none"> • Provision for sabbatical/ paid leaves for pursuing self-directed study/ training/ • Availability of intramural funding for research & incubation for start-ups • Protected time for research

3.5.2 Research infrastructure at Index participants' institution vis-à-vis other institutions in India (Table 13)

“I have a great admiration for people working in state colleges and interested in research. People who are doing research outside XXX [name of a premier institute with very high research output], they are the real heroes.”

The highlight of the comparison was a functional and designated research management system, access to modern analytical tools, and financial support to carry out academic activities. In almost 90% of the institutions where index participants were working had a designated research management unit (p=0.006). Although the control group comprised of only four institutions but as per available information, less than 20% of almost 500 medical colleges in India had functional grant management system (personal communication, Indian Research Management Initiative).(12)

Domain	Question	Institutions n (%)		Fisher's exact probability
		Leaders' institution (n-39)	Low research output (n-04)	
Institutional ecosystem respects research	Organization provide financial support to attend meetings/workshops	36 (92.3)	02 (50.0)	0.060
Research infrastructure	Access to modern data analysis tools	35 (89.7)	01 (25.0)	0.010
Grant management system	Functional & designated cell for grant management	36 (92.3)	01 (25.0)	0.006
	Auditing of the research grants part of the main auditing of the institution	34 (87.2)	02 (50.0)	0.118
	Existence of a system for doing environmental search of research opportunities	28 (71.8)	01 (25.0)	0.094

3.5.3 Perceptions of researchers based in the Global North on research ecosystem in India

Participants from the Global North did not restrict themselves to assessing only the individual investigator or the institution in isolation but also obtained their perspective on research ecosystem in Indian institutions. All the investigators from Global North perceived visible improvement in the research ecosystem in the institutions where they had been collaborating during last decade or so. However, they still felt there were several barriers to these collaborations. However, they felt there were still several barriers to undertake collaborative research in India.

“It is not just the enquiry of the person; it is the enquiry of the ecosystem in which they have to perform and how the systems are willing to change.....”

Rigid bureaucratic, administrative and financial procedures were perceived to be challenging for the investigators from Global North. Procurement processes, though ethical and strict on one hand, were considered cumbersome and time consuming. Similarly, issues of pay parity between research staff from High Income Countries (HICs) and India and variability within the country concerned international collaborators.

“Doing research in India is hard; it is hard anywhere and in India it is doubly hard!.”

Researchers based in high income countries echoed some of the concerns of Indian participants as well related to facing difficulties in attracting and partnering with researchers trained in disciplines like anthropology, health economics, social science, psychology, and biostatistics. They also perceived

that health research in India had mostly been dominated by the physicians and thus devaluing the status of social scientists, health economists and other non-clinical and non-medical streams.

“I would say impediments to collaborations, --- willingness to share data or certainly restriction on sharing of biological specimens....”

“I think India made a terrible mistake when it decided after independence to create separate research centres and remove it from universities.”

According to the research leaders from HIC stringent regulations led to hindrances and restrictions in sharing information, biological specimens or getting them tested in international laboratories. This affected the scope of research to a large extent and led to delays of the projects.

“I would say impediments to collaborations, --- willingness to share data or certainly restriction on sharing of biological specimens....”

“The ability of India now to set its own priorities and fund its own research really is a game changer.”

It was important to view the perceptions and experiences of both Indian and International researchers wanting to collaborate for research activities in India, together. Several index participants on the other hand endorsed some of these barriers mentioned as safeguard mechanisms for Indian scientist. These also helped in stimulating technology transfer to Indian institutions. It also appeared that legitimate administrative regulations which might also prevalent in their home countries were viewed as barriers in India; ethics standards of different cultures and context were to be respected and complied when asked for. Many Indian investigators perceived attempts by the international collaborators to control the study as one of the major barriers.

3.6. Differences in leadership characteristics between genders & subject speciality

Gender: Female scientists made greater attempts to achieve work life balance as compared to their male counterparts. Women researchers were likely to be more sensitive to prevailing research ecosystem of the organization and showed greater flexibility while negotiating and collaborations and leveraged their personal relationships and trust in the process. In contrast, male researchers appeared to demonstrate greater emotional intelligence and were comfortable doing policy advocacy activities.

Scientific Domain: Researchers from basic sciences and public health were more likely to pursue investigator driven research programs as compared to socio-behavioural scientists who were more influenced by the policy and program related challenges. Basic scientists were particularly careful about the complementarity and access to additional resources and technology that the collaboration brought on the table.

4. INDUCTIVE DERIVATION OF MODELS ON LEADERSHIP WITH RESPONDENT VALIDATION

Based on the literature presented, TAG identified a ‘working framework of research leadership in health India’ for further exploration in the study (Table 14).

Table 14. Proposed framework for research leadership in health for further exploration (Based on integrative literature review & the brain storming during the First TAG Meeting (10th August 2018))		
Individual	Team & Organizational	Environmental
Visionary <i>(sense of mission, focused, sense of purpose, able to communicate the vision effectively, passionate)</i>	Manager <i>(team building, shared vision, good planner, democratic, knows how and when to delegate responsibilities, faith and trust on team members, considers others' suggestions/ viewpoint)</i>	Adept at Change Management <i>(adaptation to change, make change in system, aware of changing environment, self-prepared for change)</i>
Personality traits <i>(extremely hardworking, integrity, balanced neuroticism, courage, confidence, accountability, respect rules and guidelines, positive thinking)</i>	Decision-maker <i>(ability to take bold decisions in complex and uncertain environments)</i>	Has followers <i>(commands respect/ recognition/ considered trustworthy, leads by example, role model, respectful, being creative and inspiring, values)</i>
Emotionally intelligent <i>(self-assessment, empathy, self-regulation, motivation, social skill, humility, open to criticism, emotionally stable, introspection)</i>	Mentor <i>(develop future leaders within the organization, identify natural talent, magnanimous with ideas/ humans, nurture raw talent)</i>	Is a collaborator/ networker <i>(relationship, inter-organizational, ability to collaborate)</i>
Professionally competent <i>(domain knowledge, technical competence, sense of purpose, utilize available resources effectively and efficiently)</i>	Negotiator <i>(diplomacy, ability to convince)</i>	Adaptive <i>(ethics, ability to work within the ecosystem, identifying resources, accommodating)</i>
Effective communicator	Has high awareness of Team/ self-reflective <i>(Behave like ignorant without being ignorant, gives credit and take responsibility of failure)</i>	Able to translate evidence into policy and program
Resilient <i>(persistence, 'rising from the ashes')</i>	Manages time and priorities <i>(work-life balance)</i>	

4.1 Inductively developed frameworks of health research leadership and path to leadership in resource constraint environment:

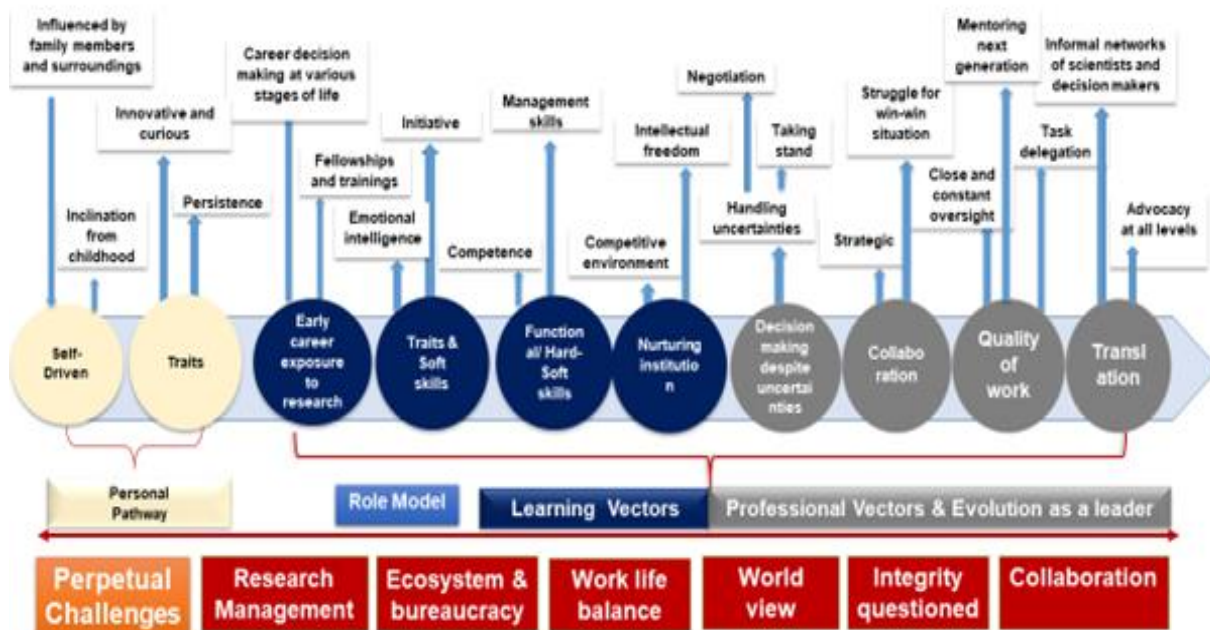
The framework developed by TAG (Table 14) helped in designing the study instruments. The data was collected and analysed inductively using grounded-theory approach. The study findings suggested that the leadership mantle rested on four pillars (that broadly grouped the characteristics of the research leader in the Indian context) erected on a research friendly ecosystem (Fig. 9).

Fig. 9. Interim inductively derived model describing the attributes of health research leaders in India (client validation)



Path to leadership was defined by their personal attributes, initial life exposures with perpetual challenges, evolving self-awareness, prowess at research management, and engage and collaborate for enhancing the value and impact of their research output. These were, however, pursuant to a research friendly ecosystem that supported the leaders' to thrive and perform (Fig 10).

Figure 10: Interim inductively derived Path to leadership (client validation)



4.2 Client validation exercise for refinement of inductively driven leadership frameworks

4.2.1. Feedback from the client validation exercise

These were discussed in detail by the participants in the respondent validation workshop (2nd TAG Meeting; 28 July 2019).

- a. The proposed path to leadership by the investigator group was rejected for being too simplistic and linear (Figure 10). The data itself suggested that almost all participants had a chequered road to achieve their current recognition and status as a research leader. Most had taken decisions despite uncertainty and were not sure about the process of achieving the sense of purpose of their professional/personal lives. The discussion indicated that there were certain events which happen as a continuum, but their linkages and sequences were ambiguous. Therefore, it was best to be presented as a ‘black-box’ of events which should be further researched in future endeavours.
- b. According to the data the ‘leaders’ have several key attributes which are influenced to a large extent by their contexts, shape their personality with potential to catapult them to leadership. These attributes are moulded by life experiences, upbringing and values, role models and mentors, and technical training; and are further enriched by the socio-cultural & economic context, and life challenges:
 1. Emotional intelligence aligned with the social and cultural context of the institution and part of the country where they are working;
 2. Capacity to take decisions despite uncertain/unknown outcomes;
 3. Risk mitigation, handling emotionally charged situations and ability to rise from ashes (Resilience);
 4. Negotiating the academic, research and administrative ecosystem at different levels;
 5. Handling and accepting negative peer perception;
 6. Ability and responsibility to influence the research ecosystem in their respective institutions and to some extent at policy level; and
 7. Knowledge and research translation at policy and program levels.
- c. The group unanimously approved the four domains for evolution of research leadership but observed that four pillars were complexly inter-related and likely to have influences on each other. It was opined that the ‘leader’ was heavily dependent on his/ her team, and hence, team skills must be discussed in detail.
- d. The participants endorsed the critical role of research ecosystem in promoting leadership in our institutions. The group also supported the concept of essential/ necessary and sufficient/desirable attributes of a leadership facilitating research ecosystem.
- e. The participants in the workshop triangulated the findings about negative perceptions by colleagues; almost all had confronted similar doubts and reservations about their integrity and ethics in research. It was suggested that domain ‘self-awareness’ may be expanded to include ‘self-awareness and peer perceptions’.
- f. Team building was emphasized as an essential element of research management and advised to re-label the domain as ‘research management & team building’.

- g. The group observed that the study had captured the details related to engagement and collaboration for research accurately for the Indian context.
- h. TAG noted that ‘resource constraint’ could have different connotations. It was reflected that within India, contexts could vary from one another in terms of access to resources. However, the group suggested that the study recommendations must be designed in a way that cuts across the different interpretations and provides for requirements of the nation as a whole.
- i. The wider societal milieu wherein researchers are respected and recognized influences the institutional research ecosystem. The country has to leverage on the available human capital and perusal of meritocracy. The commitment and conviction at the highest political level about the value of research for the overall societal development were considered valuable impetus for creating a research enabling environment.

Consequently, the inductively derived models were refined incorporating the suggestions made in the respondent validation model and finalized (Fig. 11 and 12).

4.4.2. Inductively Derived Conceptual Framework for Path to leadership

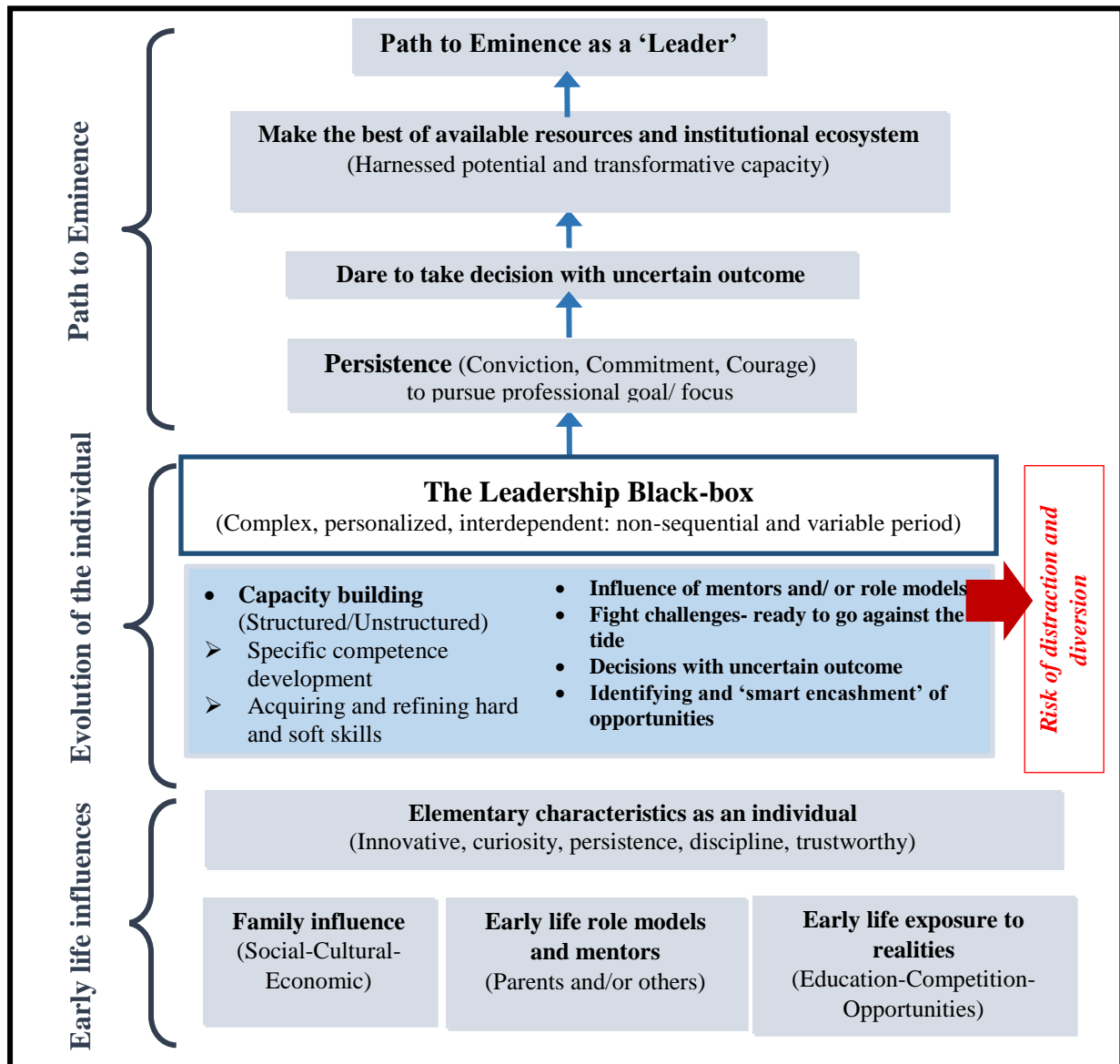
The path to leadership was not linear; several milestones and events during early life and career shaped the path of leaders. Every index participant shared highly individualized and variant experiences, especially during their formative years. The path to leadership could be summarized broadly into three phases.

Early life influences included impact of family members, initial role models and mentors in the background of the social, cultural and economic milieu of their homes. These individuals demonstrated distinctive personal attributes of innovation and curiosity, hard work, persistence, and disciplined approach to life.

Evolution of individuals towards leadership–‘the leadership black box’: The data clearly showed that the every index participant was exposed to real life challenges: competition, ability to do what they desired, unmet expectations of support from their surroundings and the general social-cultural-economic & political ecosystem. Their experiences were varied, personalized and could not be summarized into a common coherent structure or framework. And therefore, we termed this phase also as ‘*leadership black-box*’. Common characteristics of potential leaders that emerged during this phase were - their knack of identifying and creating opportunities and thereafter their ‘*smart encashment*’ with persistence and focus to propel themselves on to leadership trajectory. Index participants were frequently set ‘against the tide’ but dared to take decisions despite no support and uncertain/unknown outcomes. The leaders cited examples of several of their bright peers getting distracted and losing path to eminence due to unknown factors during this phase of their life.

Path to eminence: Almost all the index participants indicated that somewhere along their path of initial exposures and/or ‘black-box phase’, they discovered a sense of purpose towards their professional lives and focussed on a few specific areas. This often set them on path to eminence as research leaders. The index participants searched around for institutions with research friendly ecosystems, but also made best of the available resources without being grouchy. Almost all were keen to constantly enhance their competencies and considered leadership as a journey not the destination.

Fig. 11: Inductively derived model path to research leadership



4.4.3 Inductively derived conceptual framework of research leadership in health in Indian settings

Data showed that Indian research leadership required four dimensions: (1) personal traits and competence; (2) research management skills and ability to build strong teams; (3) self-awareness and work-life balance; and (4) engagement and advocacy within and outside the host institutions. Leadership characteristics were complexly inter-related and likely to have positive as well as negative influences on each other in different contexts. A research leadership tree was conceptualized that bore fruit in a research facilitating institutional ecosystem (Figure 12). It was an important observation that almost all of the index participants in the study had spent substantial portion of their research career in a particular institution to which they attributed their success. This supported the inference that it was most likely the institutional research ecosystem that provided the desired plinth for the researcher in India to build a successful research career and evolve as a 'leader'. Comparison between index participants' institutions and others (which did not have much to say about research outputs) re-

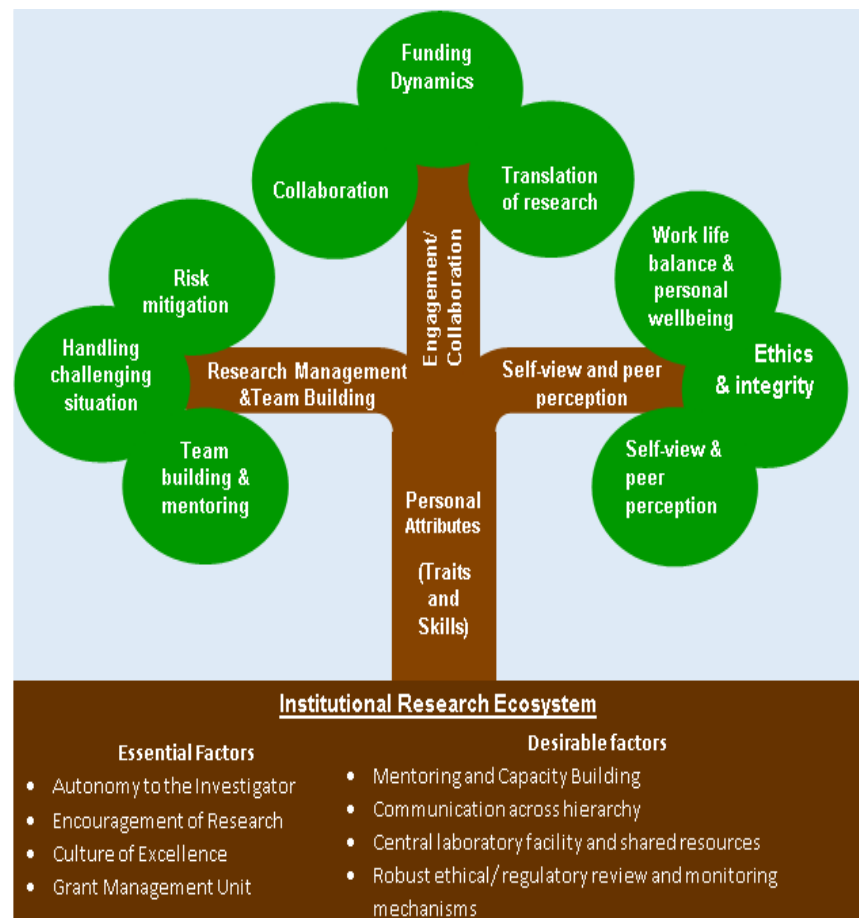
emphasized this interpretation (refer Table 12) and also probably showed that there were not many options for the potential research leaders to change places in the country.

Research friendly institutional ecosystems significantly influenced the challenges to blossom the leadership potential of the individuals. The essential features of a research friendly institutional ecosystem are: (1) intellectual freedom; (2) culture of excellence and healthy competition among peers; (3) research considered as value addition for individuals and institutions; and (4) presence of a functional grant management office in the institution. Lack of a functional research grant management system has been a consistent gap across institutions in India. Several participants indicted lack of

attractive institutional research ecosystem for difficulty in identifying index participants from North-Eastern and Central India. The research leaders evolved over time and attained a wide range of soft and hard skills through sustained efforts. All had high emotional intelligence, aligned with the social and cultural context of the Institution. However, the path to leadership was never perceived to be smooth. Researchers faced challenges in almost every facet of their evolution as leaders. Each had an individual approach towards operating within his/her team, collaborating, engaging, and negotiating with different stakeholders within and outside the institutions. The research also brought forward that not infrequently questions were raised about one's technical

competence and team management, their focus on awards and self-recognition, contribution to institutional growth, habit of over-shadowing the students and team; occasionally aspersions were also cast on their integrity and adherence to ethics. Notwithstanding these challenges, the 'leaders' continued to produce high quality research, inspired students and younger colleagues and influenced their institutional research ecosystem.

Fig. 12: Inductively derived contextual framework for leadership in health research in India



5. CONCLUSIONS & DISCUSSION

“Life should move on, and you should develop paths. Develop the path, give it to people, and let them do it. And, be happy to look back and say that they are doing so well!”

This study is among the few primary data-driven studies on leadership in health research in India. The broad characteristics of health research leadership of Indian scientists were very similar to what is reported in literature. Indian scientists have demonstrated leadership and remained scientifically and societally relevant in spite of resource constraints, non-availability of the desired institutional research ecosystems, challenges faced at different career stages, and often with no formal leadership training. Currently available health research and service provider leadership programs in India need an overhaul of the curriculum to make these relevant to the context and accelerate the process of building next generation of bio-medical scientific leadership.

The inductive derivation of the leadership models using quality- controlled research methods and empiric data was a distinctive strength of the study. Respondent validation was undertaken as a quality assurance step to further refine the leadership framework (17,18). Most of the existing frameworks and theories of leadership proposed for researchers can be critiqued for not having methodological evidence-backed derivation (19). Several contemporary studies on leadership run the risk of being prescriptive and ‘context-agnostic’ for leadership training across hierarchies while their study samples restricting to just top functionaries (e.g., chief executives) or individuals in authority/ higher ranks (4,20,21). Unlike these, this study invited index participants irrespective of their seniority, ranks and administrative responsibilities across thematic specialization, institutions, age, gender and geographic locations. Since the individual’s performance was likely to be conditioned by his/ her organization’s culture, the institutional representatives were also interacted with. The study also solicited the ‘etic’ perspective from researchers based in the Global North. Most of our index participants hailed from institutions with distinct reputation of producing high quality research output. It is a relatively new finding from the low and middle income countries—a researcher’s productivity and impact are determined by the characteristics of his/ her current institution (workplace) rather than from where s/he acquired terminal education, and that the prestige of the current institution also predicts early career productivity and subsequent prominence (22).

We described ‘health research leaders’ akin to a tree planted on a facilitating research and institutional ecosystem with requisite traits and skills as the trunk and three strong and robust branches of (i) research management & team building, (ii) engagement and collaboration and (iii) self-awareness, world view and colleagues’ perceptions, as specific leadership domains that were intimately inter-related and influenced each other in a complex manner. The institutional and research ecosystems provided the fertile context and resources (nutrients) for the growth and attainments, and also served as the rate limiter. Almost half of the leaders had colleagues who criticised their competence, doubted their integrity and ethics. Almost all of the index participants conducted research with a high level of societal commitment and personal gratification.

Our study showed that a research friendly ecosystem in institutions of higher learning was critical for the evolution of research leaders. The essential features of friendly ecosystem were intellectual freedom,

culture of excellence and competition and availability of functional grant system. Several of the key features of a research friendly institutional ecosystem as identified in our study were similar to that reported in literature from the West (1,23). The people, culture and values, and leadership have been identified as pre-requisite characteristics of high performing research institutions while collaborations and networks, strategy and funding, and institutional and departmental practice are noted as further enablers (23). Availability of a functional research grant system may be taken for granted in developed country research settings, but in Indian institutions, this emerged an essential feature for creating friendly ecosystem. Existing data from India suggested that out of almost 500 medical colleges, only 20% had functional grant management systems (24). In developing countries many opportunities go unidentified and underutilized; (25,26) individuals with leadership characteristics do not complain of what is not present but like entrepreneurs can seek out and have the ability to disproportionately exploit existing opportunities (27–30).

The path to leadership was visualized as non-linear, and highly individualized. The path was summarized broadly into three phases of life: early life influences; evolution of individuals towards leadership – ‘the leadership black box’; and path to eminence. The ‘leaders’ had come through circumstances that pushed them to taking decisions where the outcome was uncertain. They made the most out of available opportunities and resources and were ready to go against the conventional path to transform their environment and establish new facilities, structures and institutions. This is testimony to Peter Drucker’s famous statement that “*long-range planning does not deal with future decisions. It deals with the futurity of present decisions*”(31). These leaders capitalized whatever opportunity was available to them and at the same time made continual efforts to respond to future situations arising as a consequence of their decision. Perhaps, they could make these continual efforts due to attributes of resilience, grit, persistence, negotiating capabilities, ability to rise from the ashes and emotional intelligence. Even as the compendium of traits and skills in the leaders is large,(19) these attributes were consistent across the participants. Early life social, cultural and economic influences were quite prominent in shaping these attributes. The importance of relationships and networks were highlighted in this study as reported previously (3).

Leaders, despite their hard-earned reputation, had also faced allegations on their research ethics and integrity (28). Nevertheless, they managed to turn their adversities into opportunities. Literature on leadership in the developing world highlights that those who surge ahead and stand-out may trigger jealousy and adversely impact team harmony (3). However, the leaders take these criticisms as an opportunity to further improve their performance. Gritz et al have reported that leaders in Research & Development are not necessarily different from those in other sectors (28,32). Literature has established that each leadership ‘style’ is associated with some negative attribute(s), perception and impact of which may be perceived differently by peers and followers depending on the culture and country context (33). Ironically, most leaders see themselves as fair while being ignorant of their true stance! (34).

“Leaders are like the rest of us: trustworthy and deceitful, cowardly and brave, greedy and generous. To assume that all good leaders are good people is to be wilfully blind to the reality of the human condition--.”(35)

Notwithstanding the unique features and strengths of the study, there were some limitations of the study as well. Even as the complex inter-linkages between the ecosystem, personal attributes and the specific competencies of research leaders were highlighted, data to determine the relative ‘weightage’ and ‘degree of interactions between the competencies’ was not sufficient. The experiences and exposures of the index participants were complex, personalized, and dependent on factors like social and economic background and educational/ professional opportunities. The path could not be entirely characterized or sequentially narrated, hence the use of expression ‘the leadership black box’. The data did demonstrate the persistence of index participants despite uncertainties and challenges of their environments. We therefore, aggregated the findings with the assumption that broad and common lessons from the participant narrations can be drawn. The model did not differentiate between the gender and subject associated leadership attributes and challenges though data pointed to possibilities of their existence.

During the past 2-3 decades enhanced investments have been made by the Government of India to start new research scientific institutions in the country (36). Between 2007/8 and 2011/2, India witnessed an 8.8% average annual increase in health research funding (US\$ 1.42 billion); 95% from Indian sources (37). The National Health Policy of 2017 further commits to strengthen health research both in the public and private sector and support researchers through various mechanisms (37). However, the investments on research and institutions did not show consistency, and availability of research resources significantly varied between institutions and states. More recently, the Government has set aside dedicated funds for investing in the North-East (NE) to improve their research infrastructure and encourage twinning research programs for the investigators (38). Impact of such policy interventions should only be visible in coming years. Concerted multi-level interventions targeted at the ecosystem (policy environment, society and institution, and investments) and at the individual level through context tailored leadership training are required to harness the promising minds who in turn can contribute to human and societal development.

6. RECOMMENDATIONS

“I am not saying that the situation is very-very ideal; I am saying that these all things are beginning, this is just the beginning!”

6.1. Establish an ‘ease of doing research’ ecosystem at all levels

- a. *Policy*: Advocate with different ministries (Department of Health Research, Indian Council of Medical Research, Department of Biotechnology, Department of Science and Technology, Council of Scientific and Industrial Research, Ministry of Human Resource Development) and donors (national & international) for prioritizing investment to establish research friendly ecosystem. Investments should also address the existing regional and state asymmetries.
 - i. Regulatory authorities e.g. National Medical Authority (NMA), University Grants Commission (UGC), and Departments within the Ministry of Science & Technology should ensure establishment of enabling research ecosystems.
 - ii. Support establishment of functional research grant management systems in health universities, medical colleges and research institutions.
 - iii. Sensitization of principals, directors, vice chancellors and other institutional leadership across the country to value research in their institutions, encourage intellectual freedom and inculcate a culture of excellence for healthy internal competition.
 - iv. Support research leadership training programs

6.2. Restructured & contextualized research leadership training programs for Indian bio-medical scientists:

An outline of the draft contextualized curriculum for leadership training (3-day short & 10- day long duration) is proposed addressing the domains of the inductively derived conceptual framework of the research leadership in India. As the refined curriculum is rolled out in the country, there should be an inbuilt mechanism of evaluating leadership training programs.

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ANNEXURE 1: TECHNICAL ADVISORY GROUP (TAG)¹

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- **Virander S Chauhan**, Formerly Chairperson, University Grants Commission, New Delhi

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- **S Rema Devi**, Executive Director, CARING, Thiruvananthapuram
- **Sanjay Zodpey**, Vice President (Academics), PHFI, Gurugram & Director, IIPH, Delhi
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- **Chander Shekhar**, Additional Director General
- **Kalyan K Ganguly**, Scientist 'F'

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- **Navneet K Dhamija**, Deputy Commissioner (Trainings)

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- **Ekta Kapoor**, Scientist 'E', Department of Science and Technology

International organizations

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- **Rahul Srivastava**, Consultant (Public Health), Global Health Strategies, New Delhi

Wellcome Trust – India Alliance Representative

- **Shahid Jameel**, Chief Executive Officer, India Alliance, New Delhi

The INCLEN Trust International, New Delhi

- **Vijay K Panday**, Chief Operations Officer

ANNEXURE 2: INTERVIEWER PANEL (NAMES ARRANGED ALPHABETICALLY)

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- **Tejopratap Oleti**, Senior Consultant, Neonatology, Fernandez Hospital, Hyderabad

ANNEXURE 3: PROPOSED CURRICULUM FOR LEADERSHIP PROGRAMS

The data from the study and inductively driven leadership framework indicated that concerted multi-level interventions targeted at the individual researchers as well as the designated heads of institutions are necessary to prepare individuals for future generation of leadership and for impact on research ecosystem. The proposed programs and the curriculum are designed for two categories of stakeholders:

1. Young and mid-career faculty to undergo research leadership training (Level A: Basic course and Level B: Advanced course)
2. Institutional leadership for sensitization towards value of research ecosystem (e.g., vice-chancellors, directors, principals, deans etc.)

Programs targeted at young and mid-career faculty

Target participants: Young and mid-career researchers/ faculty in Indian institutions with health research mandate.

Selection of participants:

- Screening of participant profile (academic background, career performance, research initiatives, level of seniority)
- A short paragraph (300 words; statement of purpose) narrating a life experience where the applicant had to face challenges to pursue his/her dream in the professional career. The applicant will be asked to describe how s/he addressed those challenges and how s/he now reflected on the outcome.

This short essay will be assessed by the program coordinator and his group for commitment (persistence), conviction (take decision despite uncertain outcome; ambitiousness) and courage (ability to go against the tide) in pursuing a career in research in the existing institutional ecosystem.

Learning Objectives:

- Each participant is exposed to different facets of health research leadership and encouraged to evolve their personal leadership style

Approach:

- Overall approach focuses on imparting skills through fact, reflect and act approach.[1] The “Fact” aspect updates the participants on the latest concept of and theories in leadership and strategic management. The “Reflect” component helps participants through recourse assignments, exercises during the “face to face” course. The “Act” component helps them to develop personal leadership development plan based on reflection. [Reflective practice is "paying critical attention to the practical values and theories which inform everyday actions, by examining practice reflectively and reflexively. This leads to developmental insight".¹]
- **Case study based learning:** The study material has a rich case study material of 47 research leaders from the country. This can be supplemented and further enriched on regular basis. These will be used as a valuable resource for motivating the course participants to push forward the boundaries even in resource constraint and challenging research ecosystems.

¹ Bolton, Gillie (2010) [2001]. Reflective practice: writing and professional development (3rd ed.). Los Angeles: Sage Publications. p. xix. ISBN 9781848602113. OCLC 458734364

- **Contextualization requirements:** The highlight and unique features of Indian leaders were: emotional intelligence aligned with the social and cultural context of the Institution and part of the country where they are working; capacity to take decisions despite uncertain/unknown outcomes; risk mitigation, handling emotionally charged situations and ability to rise from ashes (Resilience); negotiating the research and administrative ecosystem at different levels; handling and accepting negative peer perception; ability and responsibility to influence the research ecosystem in their respective institutions and to some extent at policy level; and knowledge and research translation at policy and program levels. These characteristics need to be communicated through specifically developed modules with Indian examples.
- **Trainer profile:** Leadership mentors (preferably, two to three senior mentors) with expertise in training health researchers for personal development and experience of undertaking independent and collaborative research projects in institutions in India. In addition, session specific facilitators who lead the discussion and interaction among the participants and with facilitators. Behavioural, communication and management experts are to be essential part of the invited faculty.
- **Pre-course assignments:** The participants will be asked to draft a personal development plan and complete a mandatory pre-course reading before attending the training
- **Evaluation:** Continued mentorship and alumni network support will be provided to leverage self-evaluation and improvement.

Content:

Six modules:

- A. Theories of leadership; Health research leadership framework; & Pathway to leadership**
 - Traditional leadership theories
 - Inductively developed leadership framework and pathway to leadership as part of INCLLEN study
 - Health leadership examples from India

- B. Core characteristics of leaders & soft skills:**
 - Sensitivity to social-cultural contexts for developing and applying soft skills
 - Emotional intelligence: self-awareness, self-regulation, motivation, empathy and social skills in daily dealings and interactions (socio-culturally contextualized)
 - Communication skills: active listening, voice modulation, articulation of thoughts, public speaking, and communication including written communication and non-verbal/ body language
 - Strategic and change management (theory of change) where one needs to prepare for the anticipated change (self and team), focus on long term and future oriented goals taking environmental dynamics (economics, political, social and technology) into account
 - Strategies for handling challenging and emotionally charged situations and risk mitigation
 - Art of negotiation: influencing and persuading higher authorities and peers
 - Decision making against uncertain outcome: resilience, converting adversities into opportunities

- C. Research Management and Team Building:**
 - Administrative capabilities: time management, preparing and handling budgets, procurements, Human resource management including hiring assessing and managing difficult people
 - Project management: managing different phases in a project's lifecycle including handling project risks (delays, scope revision, resource management, problem solving)
 - Team building: selecting the right people, attracting and celebrating talent, setting a culture of quality in the team, motivation of the team members, consistent monitoring and supervision.

- Mentoring and nurturing: coaching, giving effective feedback, empowerment through delegation, capacity building through training exposures, time and performance management.
- Hard skills: writing grant proposals and manuscripts for publication

D. Collaboration and Engagement:

- Principles of effective collaboration for research: rationale (overcoming personal limitations for research and achieving synergy through complementarities); building and sustaining 'equal-partnership' collaborations
- Advocacy and translation of research: Identifying the target stakeholder constituency; networking, strategic communication and diplomacy
- Methods of disseminating research
- Funding dynamics: scanning of funding opportunities, probable challenges for attracting funds and strategies for mitigation of the same

E. Self-view and Peer perception

- Research ethics and integrity: challenges faced from peers and colleagues; a plan of action to overcome situational difficulties threatening one's reputation as a researcher.
- Self-view and peer perception: exploration of one's blind spots; preparing oneself for potential negative opinions from peers and public
- Dynamic relationship of work accomplishments and personal wellbeing

F. Research Ecosystem and the researcher

- Essential and desirable components for a facilitating research (institutional) ecosystem
- Maximizing the opportunities available in the research ecosystem and influencing the same thereby aiding to both self and institutional growth

*** Special Session on 'Meet the Leaders'**

- Leaders in health research will discuss their journey amidst the 'black box of evolution to leadership' (they will be apprised prior to their session about the aspects in their life they may want to share in detail)
- Guidelines will be provided to the leaders for an interview that would preferably be recorded and transcribed to prepare their case studies.

Level A. The Basic Course

Batch size: Up to 30 participants

Duration of the program: Four days

- **Day 1:** (8 hrs)
 - Introduction to concept of research leadership (1 hr)
 - Core characteristics of leaders & Soft skills (4.5 hrs)
 - Conceptual framework of research leadership and Pathway to leadership among Indian scientists (2.5 hrs)
- **Day 2:** (8 hrs)
 - Research management and Team building (5 hrs);
 - Collaboration, advocacy & stakeholder engagement (3 hrs)
- **Day 3:** (8 hrs)
 - Self-view and peer perception (4 hrs)
 - Case studies (2) to unravel leaders' journey to eminence (3 hrs)
 - Meet the leader (1 hr)

- **Day 4:** (8 hrs)
 - Research ecosystem in India & researcher (2.5 hrs);
 - Self-appraisal of leadership characteristics: what more to attain? (4 hrs)
 - Any other issue, the participants will like to discuss - clarify
(*These topics have been detailed in the curriculum section above. The organizer may prioritize the contents after interactions with the potential participants*)

Format:

- Residential mandatory
- ‘Level A’ training will serve as a sensitization workshop for research leadership.
- Didactic portion will not exceed 30% of the time allocated, usually at the beginning of the session.
- The brief didactic sessions will be followed by interactive cum reflective sessions wherein the participants will be encouraged to narrate real life experience, seek insights to potential alternative approaches for day-to-day performance enhancement through facilitator-to-participants and peer-to-peer learning
- Every day 1 hr group discussion for personal development plan: 7-8 PM before dinner
- Every morning to start with recap of previous day and any issues that were not understood.

Follow up: Interested participants will be encouraged to enrol for the Level B training after a gap of at least one year when they have had first-hand experience with leadership skills acquired during the ‘Level A’ workshop..

‘Level B’- The Advanced Course

Selection of participants: Same as for ‘Level A’. Participants who have already completed basic course (Level A) will be prioritized.

Batch size: Up to 20 participants

Duration of the program: 10 working days

Training approach:

- ‘Fact, Reflect, &Act’ approach.
- The brief didactic sessions will be followed by interactive cum reflective sessions wherein the participants will be encouraged to narrate real life experience, seek insights to potential alternative approaches for day-to-day performance enhancement through facilitator-to-participants and peer-to-peer learning
- Longer period available for reflective interaction between participants and with their facilitators; participants will be provided individualized in-depth analysis of one’s performance along with guidance for preparing a personal development plan
- Modern IT tools and adult pedagogical methods will be used for maximizing training effectiveness

Content:

- Six modules
 - 1 day each for modules A, D, E & F
 - 2 days each for module B
 - 3 days for module C
- Participant personal development plan: Self-appraisal of leadership characteristics - what more to **attain**
 - Day 1 (Plenary) 2 hours – this should part of the pre-workshop assignment

- 1 hr every day for personal development related discussion during pre -dinner session (in moving group structure)
- Last day ½ day: presentations by participants who are split in to 4-5 groups

Format:

- Residential compulsory.
- Every module: Didactic components not more than 10-15% of the session time & Rest of the session for reflection and evolving personalized action
- Each day two sessions: 9 AM – 1.00 PM and 2 PM – 5 PM
- Every day: 7-8 PM (group discussion for personal development)
- Every alternate day: Meet the leader – 6-7 PM (Thrice during the course)

Consultation with current ‘health institutional leadership’ to catalyse research friendly ecosystem in their respective institutions

Objective of the consultation

- Engagement of institutional leadership to identify barriers and evolve strategies to establish research friendly ecosystem in their respective institutions
- Researchers are recognized and given visibility

Target participants:

- Institutional heads/academic heads (Directors, Vice Chancellors, Principals, Deans)
- Government of India science ministries supporting health research & research councils
- National & international donor agencies supporting health research

Duration of the program:

- One day
- Multiple such programs to cover institutions and different regions of the country

Approach& Content:

- To be organized in partnership with Science ministries, research councils and department of health research
- Consultation (National and Regional) for
 - Sharing of the summary findings of the INCLLEN study “Pathway to health research leadership in India”
 - Plenary
 - Value of research in the institutional & national context;
 - Governmental policies and investments on bio-medical research infrastructure and research activities;
 - Current initiatives to cultivate research friendly ecosystem in Indian universities, medical colleges and research institutions
 - Group discussion to identify barriers and strategies to foster research friendly environments

Outcome & Follow up:

- Recommendations and next steps
- To advocate with institutional leadership and funding agencies for investments to establish functional grant management system in health institutions.

ANEXURE 4: SUPPLEMENTARY TABLES

<i>Supplementary Table 1:</i> Comparison of index participant's response with body language when the questions related to research integrity were posed									
		In your research career, did you come across any incident where research staff/ student had deliberately tampered with the research processes/ findings?				Can you narrate any incident when your research integrity or research team management capabilities were questioned by a colleague or scientific body?			
Non-verbal signal		Response- n (%)			Fisher's probability	Response – n (%)			Fisher's probability
		No	Yes	Total		No	Yes	Total	
EYE CONTACT	Overtly intense gaze	1	2	3	1.000	4	4	8	0.702
		(7.1)	(7.7)	(7.5)		(23.5)	(17.4)	(20.0)	
	Just right	13	22	35	0.640	12	17	29	1.000
		(92.9)	(84.6)	(87.5)		(70.6)	(73.9)	(72.5)	
	Avoiding occasionally	0	2	2	0.533	1	2	3	1.000
(0.0)		(7.7)	(5.0)	(5.9)		(8.7)	(7.5)		
Avoiding most time	0	0	0		0	0	0		
	(0.0)	(0.0)	(0.0)		(0.0)	(0.0)	(0.0)		
Total	14	26	40		17	23	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
TO NE OF VOICE (multiple choices possible)	Warmth	4	3	7	0.214	3	7	10	0.471
		(28.6)	(11.5)	(17.5)		(17.6)	(30.4)	2(5.0)	
	Confidence	9	24	33	0.039	15	16	31	0.256
		(64.3)	(92.3)	(82.5)		(88.2)	(69.6)	(77.5)	
Interested	1	2	3	1.000	0	4	4	0.123	
	(7.1)	(7.7)	(7.5)		(0.0)	(17.4)	(10.0)		
Total	14	26	40		17	23	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
POSTURE- GESTURE	Relaxed	13	23	36	1.000	16	21	37	1.000
		(92.9)	(92.0)	(92.3)		(94.1)	(91.3)	(92.5)	
	Stiff	1	2	3	1.000	1	2	3	1.000
		(7.1)	(8.0)	(7.7)		(5.9)	(8.7)	(7.5)	
Total	14	25	39		17	23	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
INTENSITY	Cool-flat	13	26	39	0.350	13	21	34	0.373
		(92.9)	(100.0)	(97.5)		(76.5)	(91.3)	(85.0)	
	Disinterested	0	0	0		1	2	3	1.000
		(0.0)	(0.0)	(0.0)		(5.9)	(8.7)	(7.5)	
Over the top dramatic	1	0	1	0.350	3	0	3	0.069	
	(7.1)	(0.0)	(2.5)		(17.6)	(0.0)	(7.5)		
Total	14	26	40		17	23	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
SUMMATIVE	Comfortable	13	24	37	1.000	16	22	38	1.000
		(92.9)	(92.3)	(92.5)		(94.1)	(95.7)	(95.0)	
	Uncomfortable	1	0	1	0.350	0	0	0	
		(7.1)	(0.0)	(2.5)		(0.0)	(0.0)	(0.0)	
	Enthusiastic	0	0	0		0	1	1	1.000
(0.0)		(0.0)	(0.0)	(0.0)		(4.3)	(2.5)		
Defensive	0	2	2	0.533	1	1	2	1.000	
	(0.0)	(7.7)	(5.0)		(5.9)	(4.3)	(5.0)		
Total	14	26	40		17	23*	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		

*-Multiple answer given

Supplementary Table 2. Comparison of peer perception about the index participant with body language of index participant when the questions related to research integrity were posed

Non-verbal signal		In your research career, did you come across any incident where research staff/student had deliberately tampered with the research processes/ findings?				Can you narrate any incident when your research integrity or research team management capabilities were questioned by a colleague or scientific body?			
		Overall NFI		Total	Fisher's probability	Overall NFI		Total	Fisher's probability
		Negative	Positive			Negative	Positive		
EYE CONTACT	Overtly intense gaze	2	1	3	0.565	5	3	8	0.430
		(11.8)	(4.3)	(7.5)		(27.8)	(13.6)	(20.0)	
	Just right	14	21	35	0.634	12	17	29	0.498
		(82.4)	(91.3)	(87.5)		(66.7)	(77.3)	(72.5)	
	Avoiding occasionally	1	1	2	1.000	1	2	3	1.000
		(5.9)	(4.3)	(5.0)		(5.6)	(9.1)	(7.5)	
Avoiding most time	0	0	0		0	0	0		
	(0.0)	(0.0)	(0.0)		(0.0)	(0.0)	(0.0)		
Total	17	23	40		18	22	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
-tone of voice (multiple choices possible)	Warmth	6	1	7	0.033	6	4	10	0.300
		(33.3)	(4.5)	(17.5)		(33.3)	(18.2)	(25.0)	
	Confidence	13	20	33	0.211	12	19	31	0.253
		(72.2)	(90.9)	(82.5)		(66.7)	(86.4)	(77.5)	
Interested	2	1	3	0.579	1	3	4	0.613	
	(11.1)	(4.5)	(7.5)		(5.6)	(13.6)	(10.0)		
Total	18	22	40		18	22	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
POSTURE-GESTURE	Relaxed	16	20	36	1.000	16	21	37	0.579
		(94.1)	(90.9)	(92.3)		(88.9)	(95.5)	(92.5)	
	Stiff	1	2	3	1.000	2	1	3	0.579
(5.9)		(9.1)	(7.7)	(11.1)		(4.5)	(7.5)		
Total	17	22	39		18	22	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
INTENSITY	Cool-flat	18	21	39	1.000	14	20	34	0.381
		(100.0)	(95.5)	(97.5)		(77.8)	(90.9)	(85.0)	
	Disinterested	0	0	0		1	2	3	1.000
		(0.0)	(0.0)	(0.0)		(5.6)	(9.1)	(7.5)	
Over the top dramatic	0	1	1	1.000	3	0	3	0.083	
	(0.0)	(4.5)	(2.5)		(16.7)	(0.0)	(7.5)		
Total	18	22	40		18	22	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		
SUMMATIVE	Comfortable	18	19	37	0.238	18	20	38	0.492
		(100.0)	(86.4)	(92.5)		(100.0)	(90.9)	95.0)	
	Uncomfortable	0	1	1	1.000	0	0	0	
		(0.0)	(4.5)	(2.5)		(0.0)	(0.0)	(0.0)	
	Enthusiastic	0	0	0		0	1	1	1.000
(0.0)		(0.0)	(0.0)	(0.0)		(4.5)	(2.5)		
Defensive	0	2	2	0.492	0	2	2	0.492	
	(0.0)	(9.1)	(5.0)		(0.0)	(9.1)	(5.0)		
Total	18	22	40		18	22	40		
	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)		

ANNEXURE- 4 TOOLS

SCOPING THE PATH TO LEADERSHIP IN HEALTH RESEARCH IN INDIA

A Wellcome-DBT-IA-INCLLEN Initiative

SCHEDULE FOR IN-DEPTH INTERVIEW

Date							
Name of the Participant							
Designation (last designation, if retired)							
Institute / Organization							
Area of Expertise	<input type="checkbox"/> Basic Science		<input type="checkbox"/> Behavioral Science		<input type="checkbox"/> Public Health		
Current Location	District:				State:		
Geographic Zone (Current location)	<input type="checkbox"/> North		<input type="checkbox"/> South		<input type="checkbox"/> East- North East		<input type="checkbox"/> West- Central
Duration of Interview	Start time				End time		

Instructions for the interviewers

Dear Friends,

Follow the instructions in the schedule:

- Please AUDIO record all the responses with PRIOR consent
- **Check the recorder before starting the interview.**
- Write the responses in the blank boxes provided
- Ask additional questions as and when required
- **Pause after each question for response and then ask the next question**

Preamble (this should be read aloud verbatim by all interviewers):

I am delighted to interact with you for this study entitled 'Scoping the Path to Leadership in Health Research in India'. Thank you for agreeing to participate and offer your valuable time as a research leader. This study is being conducted by The INCLLEN Trust International as a Wellcome-DBT-India Alliance-INCLLEN initiative. Our objective is to identify the core competencies of research leaders and understand their institutional ecosystem for research. This will help recommend on potential interventions to develop future leaders in health research in India. In this interview, we would request you to share your experiences so that we could have a closer understanding of your evolution as a researcher of repute. All the information collected as part of this study will be kept confidential and presented as collective anonymized results. These will not be linked to individuals or institutions.

1. Why have you taken up research as an **important/ prominent part of your professional life**? What were the **events and circumstances that encouraged** you to take up **research**?
2. What has/ have been your **major research** area/s? What were the **factors that influenced** your **choice** of these areas? (*Probe*: intellectual excitement, emotional reasons, available opportunities (funding, position), societal relevance, any others). (Please request for details).
3. How did your background training, personal experiences, available resources and situations (funding opportunities, infrastructure) **impact your choice** of research area?
4. How do/did you **ensure** that your **research** is relevant and **aligned** to changing/ evolving **global** research and development agenda and national priorities?
5. What **qualities** do you think you had as a budding researcher which helped you build a **successful career** in research? How have these evolved over the years?
6. Which **factors contributed** to your evolution as a researcher? (e.g. organizational culture, peer group, leader, mentor etc.)
7. **Institutional support and ecosystem**
 - 7a. Which is the Indian institution where you have done the most significant part of your research activities? (**Please answer all the following sections of this question in reference to this institution**)
 - 7b. In your view, what **institutional features facilitated** you to undertake research in <INSTITUTION NAME>? (*Probe* for **Intangible**: like training, mentoring, motivation, institutional culture, values, mission) and (**Tangible** feature like infrastructure, adequate space, economic resources, ethics)
 - 7c. What administrative structure(s) exist/ed in <INSTITUTION NAME> that helped in **research and grant management**? (*Probe*: Research cell for grant management)
 - 7d. What **incentives** do **researchers in** <INSTITUTION NAME> have if they attract research funds and or help **establish new techniques/facilities** in the institution?
 - 7e. Do/ did you have a critical mass of **peers** in <INSTITUTION NAME> with whom you are/ were able to **interact and get intellectual** and technical feedback on your research ideas and methodology in the pursuit of quality research? Can you please narrate any incident how such formal/ informal interaction impacted your research?
 - 7f. What **institutional barriers** do/did you perceive in conducting your research activities at <INSTITUTION NAME>? How have you overcome them?
 - 7g. Have you spent time at any institution in high income country (HIC) for research purposes? If yes, what was your **role** in the **research team**? How do you compare the **research ecosystem in that institution** with that of the Indian institution you have mentioned above?
8. During the course of your research career, you must have employed/ supervised a large number of staff. In the context of the **institutional environment**, how do/did you **ensure high quality work** despite team members' heterogeneity in culture, technical skills and motivation to work?
9. What **key characteristics/ specifications** are/were you looking for in an **individual or a team** when you **delegate responsibilities**? In your perception, how does **delegation of responsibility** differ from task allocation? What tasks would you never delegate?
10. Have you ever **worked with or partnered with another investigator** from within this country and/ or outside India?
 - 10a. If not, why?
 - 10b. If yes, why?
 - If yes, (please ask the following):
- 10c. How **inter-institutional collaboration** affected the work culture of your team (give specific example)?

- 10d. Were these **collaborations** at **personal level** or with institutional backing to promote your personal research contribution? Did these also **lead to long-term institutional** collaboration?
- 10e. Besides the technical and scientific reasons, what are/were the **PERSONAL** factors that determine/ed your decision for a collaboration? (e.g. '*what is in it for me*', mutual respect, trust building and possibility of working together again in your collaborative projects)
- 10f. Do you re-call an incident where you **faced difficulties** in any **collaboration**? How did you deal with it? What **lessons** did you learn to **re-define** your **collaboration strategy**?
11. Besides the **technical and scientific merit** of your work, what are the other **strategies** and **approaches** that you have **adopted to influence** scientific/ public policies and program? Can you please **narrate** your **experiences**? Which stakeholders facilitated to achieve your objectives?
12. Which **piece of research** of yours has given you **maximal gratification**? Why do you say so? **How** has this **impacted** your approach towards research?
13. You would have completed several funded research projects. What has been your **strike/ success rate** during your research career (number of projects submitted versus projects funded)? What **challenges** do you face to attract funded projects for your team?
14. Does it help to know people in research **funder agencies** to **successfully bid** for research grants? How does the **system ensure** that the competent people get grants?
15. Do you recall a few students/ research personnel whom you trained, who evolved as independent investigators? What **extra efforts** were required to **identify** and **nurture** these individuals?
16. In recent times have you collaborated with any of your **former mentors/ mentees/ students**, for research projects? What do you do to encourage **continuity** of your **relationships** with your mentors and mentees?
17. Describe any situation, where you had to **try hard to convince** the **authority** (ies) in your department/ institution or ignore their advice to **expedite your research** idea because in your view the idea had greater value to the science/ society/ organization? How did you **convince** others?
18. Could you please narrate an experience when you made a **choice/ decision** about your **professional and research related future/ aspiration** despite uncertainty about its outcome? How do you rate/ describe that decision in hindsight?
19. How do you **cope up** with and fulfill your **social and family commitments**, along with **research commitments**? What usually gets left out?
20. How and when do you say '**No**' to new professional opportunities?
21. Did you have **research data** which you **could not publish**? What were the **reasons**?

Q21 : Evaluating non-verbal signals				
Domains				
<u>Eye Contact</u> <u>(Only One Response)</u>	<u>Tone of Voice</u> <u>(All applicable)</u>	<u>Posture & Gesture</u> <u>(Only one response)</u>	<u>Intensity</u> <u>(Only one response)</u>	<u>Summative</u> <u>(All applicable)</u>
1. Overtly intense gaze 2. Just Right 3. Avoiding occasionally 4. Avoiding most of the time	1. Warmth 2. Confidence 3. Interested trained	1. Relaxed (body-shoulders) 2. Stiff and immobile (Folded arms/ body turned away)	1. Cool/Flat 2. Dis-interested 3. Over the top/dramatic	1. Comfortable 2. Uncomfortable 3. Enthusiastic 4. Defensive
NOTE: Tick the appropriate response				

22. In your research career, did you come across any incident where **research staff/ student** had deliberately **tampered** with the research processes/ findings? If yes, how did you respond?

Q22 : Evaluating non-verbal signals				
Domains				
<u>Eye Contact</u>	<u>Tone of Voice</u>	<u>Posture & Gesture</u>	<u>Intensity</u>	<u>Summative</u>
<u>(Only One Response)</u>	<u>(All applicable)</u>	<u>(Only one response)</u>	<u>(Only one response)</u>	<u>(All applicable)</u>
1. Overtly intense gaze 2. Just Right 3. Avoiding occasionally 4. Avoiding most of the time	1. Warmth 2. Confidence 3. Interested trained	1. Relaxed (body-shoulders) 2. Stiff and immobile (Folded arms/ body turned away)	1. Cool/ Flat 2. Dis-interested 3. Over the top/dramatic	1. Comfortable 2. Uncomfortable 3. Enthusiastic 4. Defensive
NOTE: Tick the appropriate response				

23. In your research career, did you come across any incident where the **funding agency/ any associated stakeholder** wanted/asked you to **MODIFY/ REPOSITION** your research methods/ findings? If yes, how did you respond?

Q23 : Evaluating non-verbal signals				
Domains				
<u>Eye Contact</u>	<u>Tone of Voice</u>	<u>Posture & Gesture</u>	<u>Intensity</u>	<u>Summative</u>
<u>(Only One Response)</u>	<u>(All applicable)</u>	<u>(Only one response)</u>	<u>(Only one response)</u>	<u>(All applicable)</u>
1. Overtly intense gaze 2. Just Right 3. Avoiding occasionally 4. Avoiding most of the time	1. Warmth 2. Confidence 3. Interested trained	1. Relaxed (body-shoulders) 2. Stiff and immobile (Folded arms/ body turned away)	1. Cool/Flat 2. Dis-interested 3. Over the top/dramatic	1. Comfortable 2. Uncomfortable 3. Enthusiastic 4. Defensive
NOTE: Tick the appropriate response				

24. Can you narrate any incident when your **research integrity** or research team management capabilities were **questioned** by a colleague or **scientific body**? If yes, how did you respond?

Q24 : Evaluating non-verbal signals				
Domains				
<u>Eye Contact</u>	<u>Tone of Voice</u>	<u>Posture & Gesture</u>	<u>Intensity</u>	<u>Summative</u>
<u>(Only One Response)</u>	<u>(All applicable)</u>	<u>(Only one response)</u>	<u>(Only one response)</u>	<u>(All applicable)</u>
1. Overtly intense gaze 2. Just Right 3. Avoiding occasionally 4. Avoiding most of the time	1. Warmth 2. Confidence 3. Interested trained	1. Relaxed (body-shoulders) 2. Stiff and immobile 3. (Folded arms/ body turned away)	1. Cool/ Flat 2. Dis-interested 3. Over the top/dramatic	1. Comfortable 2. Uncomfortable 3. Enthusiastic 4. Defensive
NOTE: Tick the appropriate response				

According to you, what is the **legacy** that you would be **leaving behind** for young researchers? What would you like to be known for/ what will you be known for?

- 25 Please name a few **research leaders** who in your view have **inspired** you? What do you **admire** about them?
- 26 Give an example of **emotionally** charged situation among different members of your team. How did you **deal** with it?
- 27 In your **personal experience**, what were the **characteristics of the students** who later on went on to take full-time research as a career?
- 28 India needs a large number of health researchers who take on leadership role and steer the country to global leadership in coming decades.
 - a. How can we **encourage the next generation** for opting for research career?
 - b. If you have to **re-live your past decade again**, how would you do things differently to improve the research ecosystem for yourself, colleagues and the organization?

Would you like to add anything?

Thank you for your responses.

Quality Check Sheet

Section 1: Quality Check by interviewer

a. Audio Quality: 1. Good 2. OK 3. Poor (noisy)

Section 2: Interviewer's observations about Respondent:

1. Co-operative 2. Non-cooperative

General Comments about the overall interview/ observation/ assessment:

Name of Interviewer 1: _____ Signature: _____

Name of Interviewer 2: _____ Signature: _____

Section 3: Date of dispatch (online) to the Central Coordinating Office (CCO), INCLLEN:

_____/_____/_____

Signature _____

Name of dispatcher: _____

Section 4: Quality check at CCO, INCLLEN

Transcription: 1. Complete 2. In-complete

Sign (with Date) and Name of CCO Member:

SCOPING THE PATH TO LEADERSHIP IN RESEARCH

A Wellcome-DBT-IA-INCLLEN Initiative

Schedule for Assessment of Institutional Research Ecosystem

Date	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> </tr> </table>														
Name of the Participant															
Designation															
Institute / Organization															
Area of Expertise	<input type="checkbox"/> Basic Science		<input type="checkbox"/> Behavioral Science			<input type="checkbox"/> Public Health									
Location	District:				State:										
Geographic Zone (Current location)	<input type="checkbox"/> North		<input type="checkbox"/> South		<input type="checkbox"/> East-North East		<input type="checkbox"/> West-Central								
Duration of interview	Start Time				End Time										

Instructions for the interviewers

Follow the instructions in the schedule:

- Please AUDIO record all the responses with PRIOR consent
- Check the recorder before starting the interview.
- Write the responses in the blank boxes provided
- Ask additional questions as and when required

Preamble (this should be read verbatim by all interviewers):

I am **delighted** to interact with you for this study entitled '*Scoping the Path to Leadership in Health Research in India*'. Thank you for agreeing to participate and offering your valuable time. This study is being **conducted by The INCLLEN Trust International as a Wellcome-DBT-IA-INCLLEN initiative**. Based on the results of this study, we will **develop recommendations** on how institutions can best support the **development of future leaders in health research in India**. For this, we will be interacting with you and other stakeholders in your institution to understand the research ecosystem and opportunities. All the information collected as part of this study will be kept **confidential and** presented as collective anonymized results. These will not be linked to individuals or institutions.

SECTION A
(GUIDE IN-DEPTH INTERVIEW WITH DEAN/ HEAD RESEARCH/ FACULTY-IN-CHARGE-RESEARCH)

- *Serving Dean/ Head (Research); Faculty-in-charge (Research) of the institution*
 - Order of preference for respondent selection:
 1. Dean (Research)
 2. Faculty-In-Charge (Research)
 3. Faculty-In-Charge (Ethics Committee/ Scientific Review Board/ Equivalent)
 4. Head of the Institution or his/ her deputy
 - If the team is interacting with the Head of the institution as part of the non-formal interactions, request him/ her to participate in the research eco-system IDI after the NFI or to identify an official who could respond (as per order of preference above)
 - If the Head of the institution is the index participant ('leader'), then ask him/ her to identify an official who could respond (as per order of preference above); **DO NOT conduct the institutional ecosystem IDI on the index participant ('leader')**.
 - CCO team will facilitate with the contact details and also if possible, secure appointments for the institutional ecosystem IDI through telephonic/ email communications; The CCO team will also keep the interviewer team informed on this.

1. Good quality research done in an institution is never by chance. In your view, what are those **factors and administrative processes** that **facilitate** the faculty in your institution **to undertake research** despite their other responsibilities?
2. Could you please describe the **departmental and institutional administrative and technical processes/ steps** that an investigator (faculty) in your institution **has to go through** while submitting a **research grant application** to the funding agency?
3. What kind of **support** is provided by your **Institution** to the investigator to **manage the grants**?
4. What kind of **administrative guidelines** exist for the investigator to **manage** the **HR** and **financial resources** obtained through the project/ grant?
5. How do the **institution and departments monitor** the progress of funded research projects?
6. How does the institution **maintain communication** with the **funding agencies** whose projects are ongoing?
7. What **roles** do the departmental **heads, dean and director** play to **encourage** young investigators to take up research in their domains of choice?
8. What **major challenges** do you think investigators/ faculty members in your institution would be experiencing in **receiving and utilizing** research grants?
9. What are the **common reasons** when faculty, not actively engaged in research, give for their **inability to focus** and **pursue** their **research interests**?
10. What **in-house research capacity** building and mentoring opportunities are **available** to faculty/ investigators?
11. In your view, what **administrative** improvements are required to make the **research ecosystem** further **facilitating** for young faculty members/ investigators?
12. In your memory, what **major research** contribution has come up from your **institution** in the **last 10 years** that has **influenced policy**, public health programmes, clinical care and/ or collaboration with industry?

Anything you would like to add?

Thank you for your time!

SECTION B (CHECKLIST)				
S.no	RESEARCH SUPPORT SYSTEM	Yes	No	Remarks/Comments
1.	Does your institute/organization have a designated cell for research grant management?			
2.	If yes, what all services are provided to manage the research grant by this cell?			
3.	Are investigators allowed to recruit the research staff on their own?			
4.	Are investigators expected to take permission of their HODs/ Director/ Dean to use research funds?			
5.	Does your institution give small grants to faculty to initiate research projects (Seed Grants)?			
6.	Does your institution allocate funds for research methodology training for faculty?			
7.	Does your institution sponsor faculty for higher education/training (fellowship) that encourages faculty to take up research on their return?			
8.	Is the auditing of the research grants part of the main auditing of the institution?			
S.no	RESEARCH SUPPORT SYSTEM	Yes	No	Remarks/Comments
9.	Does the finance officer of the Institution give the Statement of Expenditure (SOE) to the funding agency?			
10.	Are funded research project monitored for their technical milestones?			
11.	Are funded research project monitored for their budgetary expenditures?			
12.	Is there an institutional mechanism to interact with funding agencies whose projects are ongoing in the institution?			
13.	How administrative support for entering in to collaborations with funding agencies and academic partners (e.g. MoUs) provided to investigators?			
14.	Is there a system of doing environmental search for research opportunities from different national/international funding /donor agencies?			
15.	Does the institution provide protected time for doing research?			
16.	Does the institution give credit to the faculty/ scientist for research funds attracted/ research done in their annual confidential reports/promotions?			
17.	Does your organization allow paid leaves to attend workshops/ professional association meetings/ other academic and or research programs?			
S.no	RESEARCH SUPPORT SYSTEM	Yes	No	Remarks/Comments
18.	Does the organization provide financial support for faculty to attend meetings/ workshops etc.			
19.	Does your institution/ organization provide sabbatical opportunity?			
20.	Has your organization organized lectures by external experts/ scientists/ faculty in the past one year?			
21.	Is there a department or dedicated team of personnel to support research activities including data handling and analysis in your Institution?			

22.	Does the Institution have a central research laboratory which can be used by investigators from different departments?			
23.	Is your campus Wi-Fi enabled?			
24.	Does the institution have access to library facilities?			
25.	Does the institution subscribe to online journal facility?			
26.	Does your institute/organization has access to modern data analysis tools?			
27.	Is sufficient space provided to individual investigators for build their own lab?			
28.	Does the institution have an independent human ethics committee?			
29.	Does the institution have an independent animal ethics committee?			
30.	Does the institution have a scientific research review board or equivalent?			
Sl. No.	Item	Response		Remarks
31.	Number of ongoing funded research projects (single institution/ multi-centric)			
32.	Number projects of funded by national agencies /organizations			
33.	Number of projects funded by international organizations?			
34.	Total number of grant applications submitted for competitive grants in the past year			
35.	Approximate value of current funded research portfolio in the institution (in Indian Rupee)			

BRIEF ABOUT THE ORGANISATION:		
36.	Year of establishment	
37.	Type of institution (Fully funded by) [Please tick the appropriate response]	1. State government 2. Central government 3. Autonomous 4. Private 5. Joint venture (PPP) 6. Philanthropy (Trust/ NGOs, etc.)
38.	Courses offered [Please tick the appropriate response]	1. PhD 2. Masters (Basic Sciences/Life sciences/Social Sciences/Public Health) 3. MD/MS/ DM/ MCh
39.	Total number of permanent faculty/research scientists working in the Institution currently	
40.	Accreditations/Certifications/permissions(as applicable; also record year of receipt) (Please write the response number within the box.).	1. FCRA 2. NAAC 3. NABL 4. SIRO 5. WHO collaborating centre

SCOPING THE PATH TO LEADERSHIP IN HEALTH RESEARCH

A Wellcome-DBT-IA-INCLIN Initiative

Guide for non-formal interactions with colleagues

Four or five persons from the institute

- Director/ Principal/ Dean of the Institution
- Head of the department
- Two departmental colleagues (preferably, one senior and one junior colleague)
- 1 peer from other department (preferably, who the index participant has collaborated for research)

- **The team has to conduct five NFIs to get inputs about the index participant ('leader'):**
 - 1 with Head of the Institution (or, in absentia, his/her deputy)
 - 1 with Head of the Department (or, in absentia, his/her deputy)
 - 1 with a senior colleague from the Department (professor or equivalent)
 - 1 with a junior colleague from the Department (to be identified by the HOD or his/ her deputy)
 - 1 with a colleague from other department with whom the index participant has worked for research, preferably of similar seniority/ position.
- The team may have to be happy with lesser number (3-4) of NFIs as this depends on the strength of the department and institution. Similarly, if the team feels to conduct more NFIs, it may choose to do so.
- **PLEASE NOTE:** Since these are NFIs, DO NOT read out from the schedule provided. These queries must be administered as non-formal explorations without looking at the schedule.
- **PLEASE NOTE:** The team must summarize each NFI as a paragraph after the interaction in the format below:

NON-FORMAL INTRACTION GUIDE

Perspective regarding the index participant ('leader')

- How long has been your association with < Name > and in what capacity?
- <Name> has by and large earned a **reputation** of a **successful researcher**. **Why** do you think s/he could do so?
- **How** < Name > is getting/ has got as many research grants/ funded projects?
- What do you think are **the factors** that could have **influenced <Name>** to choose the **research area/s** of his/ her lifetime's work?
- What aspects of <Name> did you find **unique** as a **professional colleague** and a **researcher**? How does s/he come across as an individual?
- As a researcher, <Name> must be employing a large number of research staff and/ or mentoring post-graduate/PhD students. What has been her/ his **reputation** as a **team leader** and a **mentor**?
- In the context of institutional and laboratory **environment, heterogeneity** of the social and academic background, and technical skill sets of the research staff, how could <Name> generate his/ her **research output**?
- <Name> is **best known** for which **research** project/program? What **impact** have these had?
- In your view, how has <Name> **influenced** her/ his department, **younger** faculty members and **institution** at large (if any)?

NOTE

- Please refer below format for summarizing non-formal interaction (NFI).
- Do not forgot to add "**Quotable Quote**" while summarizing the NFI
- Try to summarize the interaction same day (while your memory is fresh).
- Send the soft copy of the summary after the completion of assessment (i.e. within 48 hrs.) to central coordinating team for further work-up

FORMAT FOR SUMMARIZING THE NON-FORMAL INTERACTION

Name of the index participant (Leader):

Name of the participant for non-formal interaction:

Designation:

Date of Interaction:

Perspective on the index participant

- *as an individual:*

- *as a team player*

- *as a part of the overall institutional ecosystem and external research environment*

Any other remark(s)