Institute of Medical Science
UNIVERSITY OF TORONTO

Institute of Medical Science
MSc Futures Project 2025

SUMMARY

The Institute of Medical Science (IMS) MSc Futures Project is an initiative to determine the career trajectories of Master of Science (MSc) students who graduated from IMS between 2009 and 2022. Starting with graduation data provided by the School of Graduate Studies, information on alumni was gathered using internet searches of publicly available, open-access data sources such as LinkedIn profiles, websites, and university and company directories. The study was first conducted in 2018 and then updated in 2024. Data shows that more than a quarter (26.6%) of MSc students transferred directly into the PhD program. A total of 839 individuals remained in the MSc program and graduated with this degree. We were able to successfully determine the recent (2023) employment or education status of 73% of these MSc graduates. Findings indicate that nearly half (45%) of the alumni located were employed, mainly in the public sector (61%), post-secondary education (19%) and private industry (13%). Of those graduates who pursued further education, the majority went to medical and other professional schools (71%) or PhD studies (21%).

INTRODUCTION

The purpose of the IMS MSc Futures Project was to determine the recent (2023) professional positions of the 839 individuals who graduated between 2009 and 2022 with an MSc from the Institute of Medical Science, within the Temerty Faculty of Medicine at the University of Toronto (U of T). This research study was inspired by ongoing strategic planning efforts to advance the IMS graduate training program for current and prospective MSc students, and to acquire knowledge of the professional competencies required to pursue diverse career opportunities.

The IMS was established in 1968 to foster education and scholarship in the clinical departments of the Faculty of Medicine. The IMS specializes in translational research with a strong emphasis on bench-to-bedside clinical applications. It is a graduate unit of choice for medical doctors seeking training as clinician-scientists.

Today the IMS is one of the largest graduate units at the University of Toronto, with over 700 faculty members (90% of whom hold medical degrees) and 500 MSc and PhD graduate students. The IMS does not offer any undergraduate programs and relies on other departments at U of T and other universities for the source of its BSc graduates.

IMS faculty members are typically scientists, clinician-investigators and clinician-scientists working in university-affiliated hospital research institutes. There are numerous faculty who hold international medical degrees (MDs), along with MSc and PhD degrees. Some IMS faculty members hold a PhD degree without medical qualifications and commonly have their primary academic appointment in an alternative Temerty Medicine department, such as Physiology, Laboratory Medicine and Pathobiology, or Medical Biophysics.

Faculty members are deeply involved in the education and training of medical students, interns, and residents. Most run basic or clinical science laboratories, and all hold an appointment in the School of Graduate Studies, allowing them to supervise MSc and PhD graduate students enrolled in IMS.

METHODOLOGY

A team of student researchers obtained lists of MSc graduates from existing student registry data held by the School of Graduate Studies at U of T between September 2009 and September 2022. After the data was verified and input into the survey tool (Appendix 1), the team filled in the remaining sections for each individual located online with as much information as possible, which included: further education, research activity, employment sector, and skills pertaining to their current employment. This information was only recorded if it was found in two or more reliable internet sources, with LinkedIn providing the most comprehensive information. All stages of data collection were completed within IMS or on secure U of T servers, and no information was stored on personal computers. No individuals were contacted during this project.

STUDY TEAM

Study Investigator: Reinhart Reithmeier

Project Leads: Alaa Youssef, Anna Mandel and Sarah Topa

Data Analysis: Alaa Youssef, Sarah Watling and Anna Mandel

Data Collection Team: Sarah Topa, Alaa Youssef, Sarah Watling, Corinne Doroszkiewicz, Yvonne Bach and Anna Mandel

Report Preparation: Alaa Youssef, Reinhart Reithmeier, Sarah Topa and Anna Mandel`

Report Review: Alaa Youssef, Sarah Watling, Reinhart Reithmeier, Sarah Topa, Anna Mandel and Pamela Plant

Survey and Project Design: Reinhart Reithmeier, Sarah Topa and Alaa Youssef

Profile of MSc Students and Graduates from 2009 to 2022

During 2009 to 2022, a total of **1143** students were enrolled in the MSc program at the Institute of Medical Science. Of this number, **304** students (26.6%) transferred directly into the PhD program at IMS without completing their MSc degree. Therefore, a total of **839** (73.4%) individuals remained in the MSc program and graduated with this degree. We were able to determine the recent (2023) employment or education status of **616** (73.4%) of these MSc graduates.

Most of the 839 students who graduated from the MSc program were admitted with a BSc degree (72%), commonly from the University of Toronto (38%), McMaster University (7.5%) or Queen's University (7%). Furthermore, 17% of students admitted held an international MD and 8% a Canadian MD degree (Fig. 1).

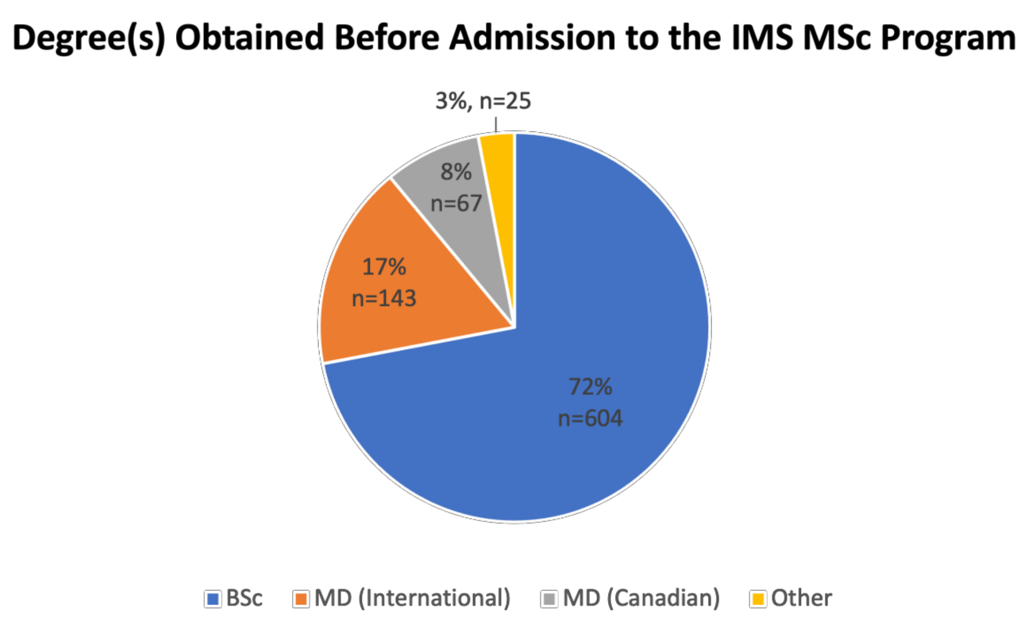

Fig. 1. The chart above illustrates the breakdown of MSc graduates based on degree(s) obtained prior to admission (n=839).

Most MSc students enrolled between 2009 to 2022 were Canadian citizens (80%). The remainder were permanent residents (16%), with a small number (4%) of international students (Fig. 2).

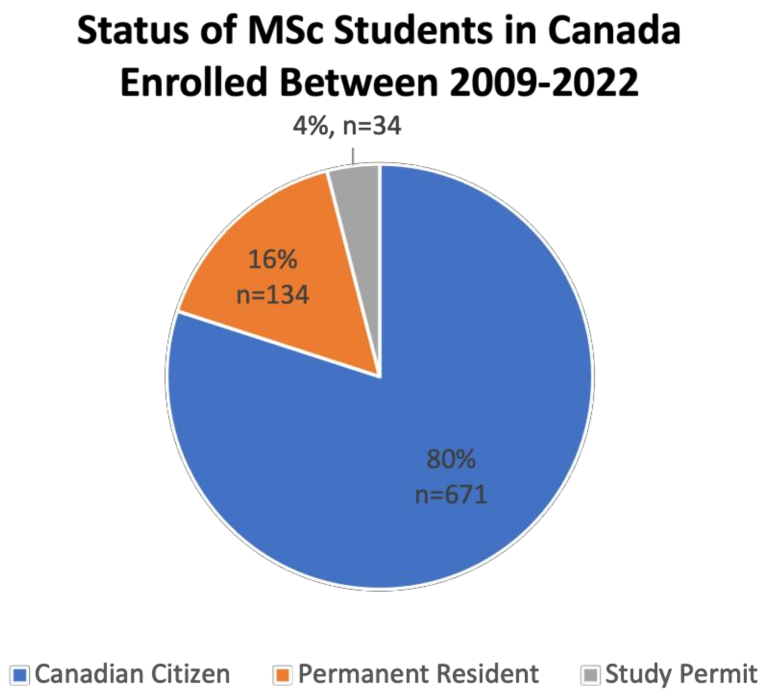

Fig. 2. Citizenship status of MSc students (n=839).

The number of MSc graduates per year increased over time from ~40 in 2009 to ~70 in 2022 (Fig. 3). There was a similar increase between 2009 and 2014 with a plateau between 2014 and 2022. Females made up a slight majority (58%) of graduates, and males a slight minority (42%) with the female: male ratio increasing slightly over time.

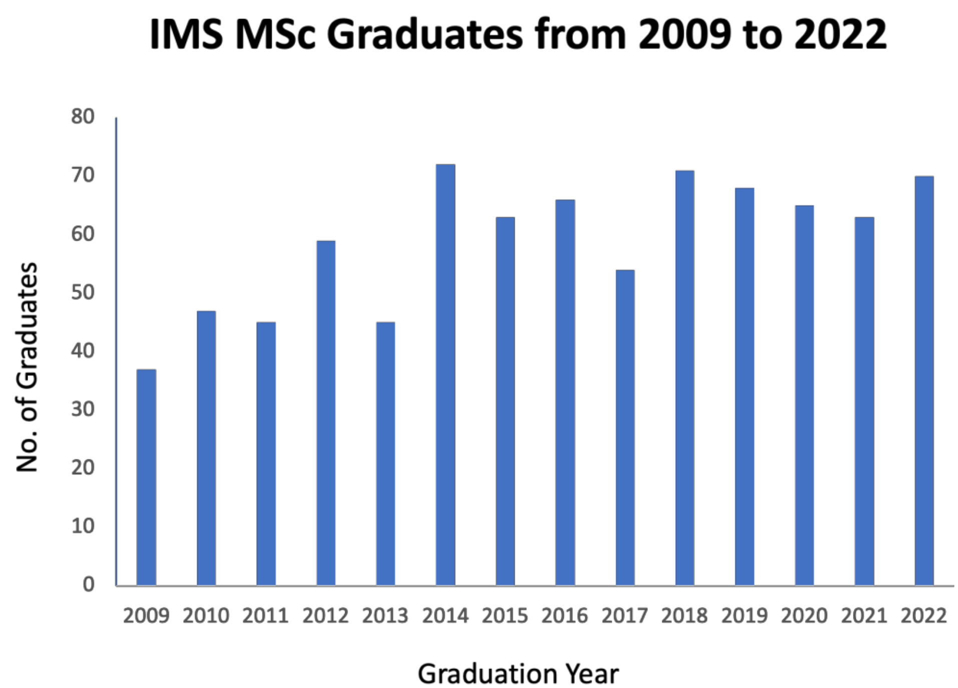

Fig. 3. The chart above shows the increase in the number of MSc graduates from 2009 to 2022 (n=839).

Of the 1143 enrolled students, 309 (27%) transferred directly into the PhD program at IMS, 335 (29.3%) continued their education in medical or other professional schools (22.5%), or in PhD studies (6.2%) or a combined MD/PhD program (0.6%) after graduating with their MSc degree, 281 (25%) were employed, and 223 (20%) could not be located online. Overall, 33.8% of MSc students decided to pursue a PhD, either via direct transfer or following their graduation from the MSc program (Fig. 4).

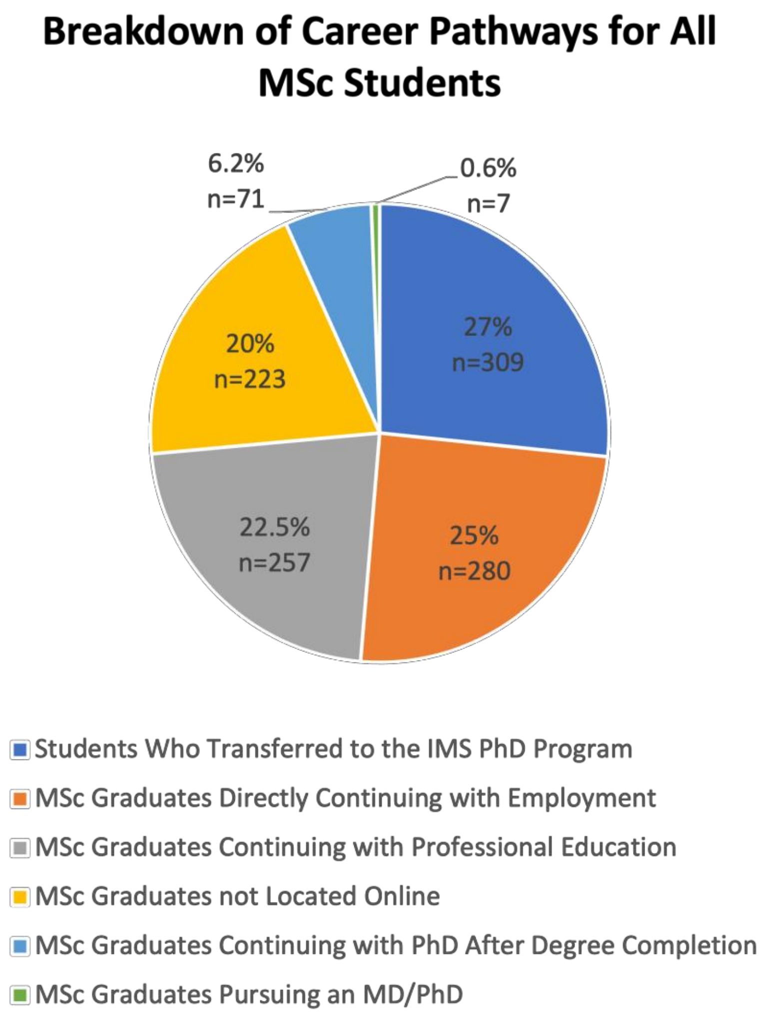

Fig. 4: Overall career trajectory breakdown of the 1143 MSc students enrolled in MSc program at IMS between 2009-2022.

The Public Sector Attracts MSc Graduates

The 281 graduates who went directly into employment were classified into the following five employment sectors (Fig. 5): 1) public, 2) post-secondary education (PSE), 3) private, 4) individual and 5) charitable. PSE includes university professors (both tenure-stream and adjunct), lecturers, and post-doctoral fellows. Results show that 61% are working in the public sector, 19% in PSE, 13% in the private sector, 5% in the individual sector and 2% in the charitable or other sectors. Graduates working as scientists in university-affiliated hospital research institutes with university appointments as professors were classified under PSE, while those without a university appointment mostly occupied positions in the public sector, mainly working at hospitals as clinicians.

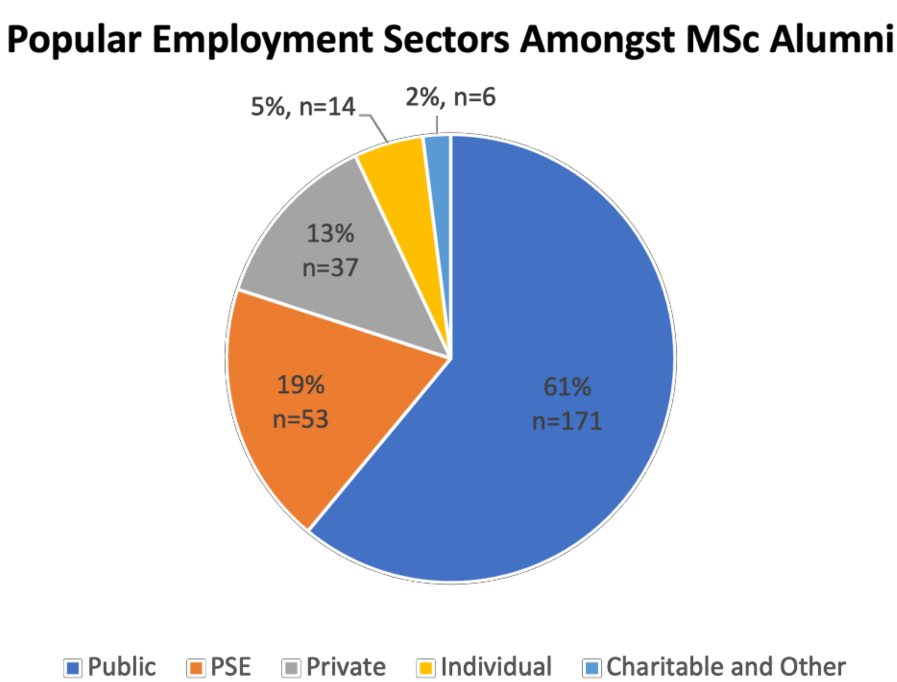

Fig 5. The above chart illustrates the proportion of MSc graduates working in various employment sectors (n=281).

MSc graduates who entered the IMS without an MD and did not pursue further education, were employed in the public sector as research coordinators, research analysts, lab managers, and lab technologists in hospital research institutions. The remaining graduates working in research institutes also had full-time adjunct/status-only University appointments besides their hospital affiliations (12% of graduates). MSc graduates with Canadian MD degrees were more likely to assume clinician-investigator or clinician-scientist stream positions post-graduation, securing employment in research institutions with an appointment in academia as clinical/status-only professors. These researchers typically carry a clinical load or research load and train medical students but are also supervising graduate students and fellows.

A small proportion of MSc graduates assumed non-academic roles in the private sector (13%). The majority of these alumni were employed by biotechnology and pharmaceutical companies (35%), while others worked in research and development (15.5%), media and publishing (8.5%, mainly scientific publishing), banking, finance and investment (8.5%, mainly healthcare investing), sales and services (5.5%), management and administration (5.5%), law and legal (4%), engineering and computer technology (3%), arts and culture (3%), marketing and advertising (1.5%), IT (1.5%) and other (8.5%). In the individual sector (5%), graduates work as consultants (52%), are self-employed (27.5%), or own independent businesses (17%).

Many MSc Graduates Enroll in Doctoral or Professional Education Programs

Of the 335 MSc graduates who pursued further education, 71 students (21%) subsequently enrolled in a PhD program, excluding those that were accepted to an MD/PhD program (Fig. 6). Most (78%) continued their PhD education in IMS at the University of Toronto.

The majority (240 or 71.6%) of MSc graduates who pursued further education went into professional schools. Of these 194 (58%) went to Medical School, 7 pursued a combined MD/PhD program, 17 went to Dental School (5%), while 12 (3.5%) pursued a variety of health profession programs including Nursing, Optometry, Veterinary School, Physical Therapy, Clinical Psychology, Osteopathic Medicine and Midwifery programs, 7 (2%) to Management Business Administration (MBA) programs, and 3 (1%) to Law School. Finally, 24 (7%) pursued miscellaneous education programs such as communications or media studies.

Clearly, an MSc degree from IMS allows those entering with a BSc to be competitive for acceptance into PhD programs and professional schools.

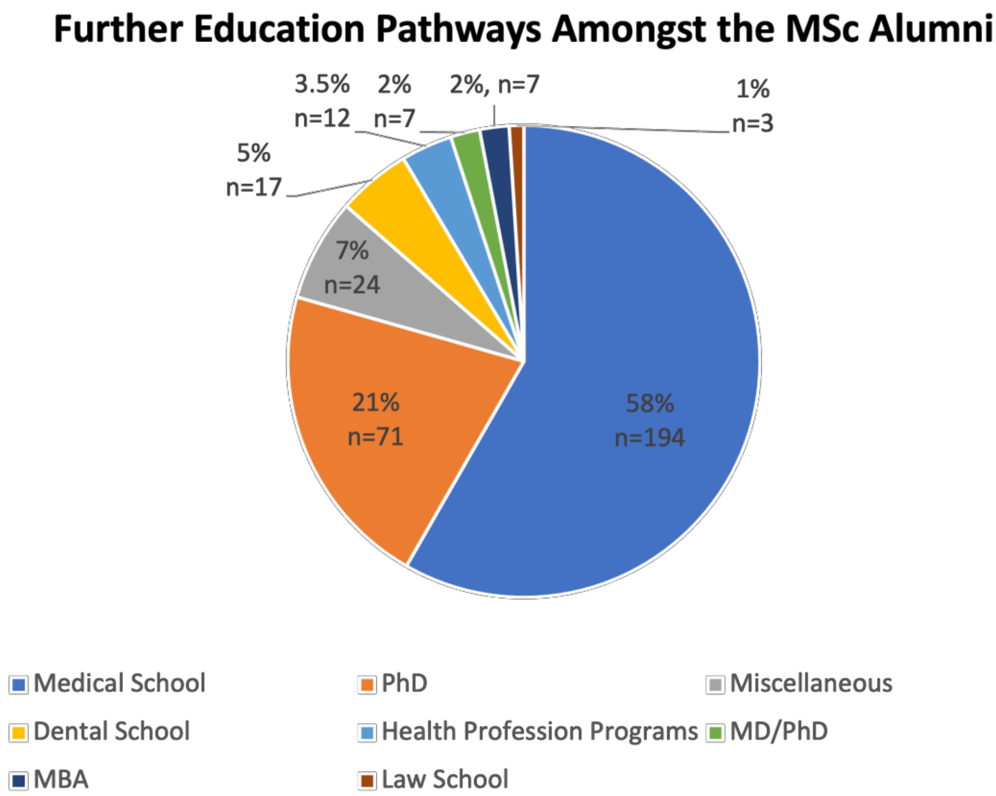

Fig 6. Chart representing the different educational pathways MSc alumni pursued (n=335).

MSc Graduates Are Mainly Employed in Academic Medicine

The top employers of IMS MSc graduates are the University of Toronto, Hospital for Sick Children, University Health Network, Centre for Addiction and Mental Health, Sunnybrook Health Sciences Centre, and McMaster University. This demonstrates that many MSc graduates stay within the academic-medical field in the Greater Toronto Area.

DISCUSSION

Career Outcomes

Advances in medical science training have revolutionized the career opportunities graduates choose to pursue within academia and beyond. This project highlights how the MSc program at the Institute of Medical Science is a valuable gateway for students aspiring to pursue further education in Medicine and other careers in the public, post-secondary education, and private employment sectors. IMS graduates' career outcomes ranged from clinician-investigators, clinician-scientists, researchers in hospital research institutes, industry positions in research implementation and innovation, to individuals working at prominent consulting firms.

Preparing MSc Graduate Students for Diverse Careers

Preparing our current MSc students for an ever-changing, diverse career landscape post-graduation requires we recognize the new knowledge domains and professional competencies our graduates should possess to maximize their impact and success in their chosen professions. For example, in addition to research-related skills, most IMS graduates' LinkedIn profiles identified analytical and communications skills, and leadership and project management to be components of their qualifications. Training our students to develop these important transferable skills during their graduate education is a priority for IMS. Graduate professional development (GPD) is an integral part of the IMS graduate program, evidenced by our for-credit GPD courses, Career Mentorship Program, career panels, workshops, new *ChatGPD* podcast featuring successful alumni, and the Individual Development Plan program requirement introduced to all incoming students and their supervisors in 2023.

Attracting International Students

The Institute of Medical Science's MSc program attracts a diverse pool of international students from countries across the world. Most MSc students with international MD degrees came from Ireland and Saudi Arabia, followed by the United Kingdom, United Arab Emirates and other countries across Europe and South America. An MSc from IMS can serve as a means for entry into Canada and the many opportunities this country provides. It is worth noting that MSc international students with BSc degrees were primarily from the United States. This means that collaborations between U of T and American institutions that foster internships or student exchange may help attract top students. Similarly, future initiatives to attract international students from other countries should consider promoting the MSc and PhD programs at IMS to establish or strengthen international collaborations. IMS faculty members and alumni from other countries could provide important linkages to attract international students and develop collaborative research projects and educational initiatives.

CONCLUSION

The MSc program at the University of Toronto's Institute of Medical Science provides students with a valuable gateway to further their education and to secure positions as professors, clinician-scientists and research scientists in hospital research institutes and biotechnology companies, and as physicians in the local and wider community.

Appendix 1:

University of Toronto Institute of Medical Science MSc Graduates Employment Survey

* Required

Personal Data from IMS Records

1. Year of Graduation: *

2. Last Name: *

3. First Name(s)/Alternate First Name *

4. Degree(s) Obtained Before Admission:

- [ ] BSc
- [ ] MD (Canadian)
- [ ] MD (International)
- [ ] Other

5. Former Institution(s):

6. Gender:
   - ○ Female
   - ○ Male
   - ○ Unknown

7. Status in Canada:

8. Country of Citizenship:

9. Supervisor:

10. Co-Supervisor:

11. Thesis Title:

Public Contact Information

12. Online Presence/Information found: *

◯ Yes

◯ No

13. Email:

14. LinkedIn:

15. Other:

Further Education After Graduation (Graduate School)

16. Program:

17. Degree Type:

18. Institution:

19. Department/Graduate Unit:

20. Supervisor (Same as MSc/Other):

21. Location City:

22. Location Province/State/Region:

23. Location Country:

24. Start Date:

25. End Date:

Further Education After Graduation (Professional School)

26. Program:

- ◯ Medical School
- ◯ Pharmacy School
- ◯ Law School
- ◯ Veterinary School
- ◯ MBA
- ◯ Dental School
- ◯ Other

27. Degree Type:

28. Institution:

29. Department/Graduate Unit:

30. Location City:

31. Location Province/State/Region:

32. Location Country:

33. Start Date:

34. End Date:

First Employment Position After Graduation (Primary)

35. Position:

36. Time:

- ◯ Full-time
- ◯ Part-time
- ◯ Unknown

37. Start Date:

38. End Date:

39. Employer:

40. Location City:

41. Location Province/State/Region:

42. Location Country:

First Employment Position After Graduation (Secondary/Concurrent)

43. Position:

44. Time:

- ○ Full-time
- ○ Part-time
- ○ Unknown

45. Start Date:

46. End Date:

47. Employer:

48. Location City:

49. Location Province/State/Region:

50. Location Country:

Current Employment Position (if different than prior)

51. Position:

52. Time:

- ○ Full-time
- ○ Part-time
- ○ Unknown

53. Start Date:

54. Employer:

55. Location City:

56. Location Province/State/Region:

57. Location Country:

Previous Employment Position

58. Same as Current Position:

◯ Yes

◯ No

59. Position:

60. Start Date:

61. End Date:

62. Employer:

63. Location City:

64. Location Province/State/Region:

65. Location Country:

66. Other Previous Positions - Title and Years:

Employment Position During Graduate School

67. Position:

68. Start Date:

69. End Date:

70. Employer:

71. Location City:

72. Location Province/State/Region:

73. Location Country:

74. Other Positions:

Volunteer Position During Graduate School

75. Position:

76. Start Date:

77. End Date:

78. Employer:

79. Location City:

80. Location Province/State/Region:

81. Location Country:

82. Other Positions:

Active in Research/Scholarly/Teaching Activities Related to Field of Study/Discipline

83. Regularity of Activity:

- ◯ Very much so
- ◯ Somewhat
- ◯ Not at all
- ◯ Unknown

84. Type of Activity:

- ◯ Basic research
- ◯ Applied research
- ◯ Clinical research
- ◯ Teaching
- ◯ Professional training
- ◯ Research administration
- ◯ Consulting
- ◯ N/A
- ◯ Other

Five Main Employment Sectors

85. Five Main Employment Sectors:

- ☐ 1: Post-Secondary Education (PSE) - University Professor/Lecturer/Administration
- ☐ 2: Public Sector - Government/Hospital/Education/Broader Public
- ☐ 3: Charitable Sector - NGO/Not-for-profit/Community
- ☐ 4: Private Sector - Industry
- ☐ 5: Individual Sector - Consulting
- ☐ Other

86. Sector 1: Post-Secondary Education (PSE)

- ○ University Professor (Assistant/Associate/Full Professor, full time, tenure-track, research and teaching, administration)
- ○ University Professor/Lecturer (full-time teaching, administration)
- ○ University Professor (full-time, status-only, adjunct, affiliated research institute)
- ○ University Professor (part-time, research and/or teaching)
- ○ University Lecturer (part-time, sessional, contract teaching)
- ○ College (non-degree) Lecturer (full-time teaching)
- ○ College (non-degree) Lecturer (part-time, sessional, contract teaching)
- ○ University or College Administration/Service Provider (full-time)
- ○ University or College Administration/Service Provider (part-time)
- ○ Research Associate/Assistant/Contract (full-time)
- ○ Other

87. Sector 2: Public Sector

- ◯ Government
- ◯ Hospital
- ◯ Health-services (non-hospital based)
- ◯ Education
- ◯ Broader Public Sector
- ◯ Other

88. Sector 3: Charitable Sector

- ◯ Health-related
- ◯ Community Development
- ◯ Arts and Culture
- ◯ Education
- ◯ Social Services
- ◯ Research and Public Policy
- ◯ Human Rights and Dignity
- ◯ Religious
- ◯ Animal Welfare
- ◯ Sports and Entertainment
- ◯ International/NGO

89. Sector 4: Private Sector

- ◯ Information Technology, Internet, Social Medical (Google Microsoft, Facebook)
- ◯ Banking, Finance, Investment
- ◯ Industry, Research and Development
- ◯ Biotechnology/Pharmaceuticals
- ◯ Engineering/Computing Technology
- ◯ Law and Legal
- ◯ Management and Administration
- ◯ Media, Publishing
- ◯ Marketing/Advertising
- ◯ Event Planning
- ◯ Public/Government Relations
- ◯ Sales and Service
- ◯ Arts/Culture
- ◯ Sports/Recreation
- ◯ Environment/Agriculture
- ◯ Trades/Transport/Equipment Operation/Manufacturing
- ◯ Other

90. Sector 5: Individual Sector

- ◯ Independent Business
- ◯ Self-Employed
- ◯ Consulting
- ◯ Family Care
- ◯ Unemployed
- ◯ Retired
- ◯ Other

Essential Skills and Core Competencies

91. Pick Top 3 from LinkedIn:

- ☐ Communication
- ☐ Information Gathering and Data Analysis
- ☐ Innovation/Entrepreneurship
- ☐ Leadership/Mentoring
- ☐ Project Management
- ☐ Research Related Skills
- ☐ Strategic Thinking
- ☐ Teaching and Knowledge Translation
- ☐ No LinkedIn Account
- ☐ Other

Data Sources Utilized for Information

92. Choose all that apply:

- ☐ AcademiaEdu
- ☐ Academic Directories/Databases
- ☐ Beyond
- ☐ EFactor
- ☐ Facebook
- ☐ Google
- ☐ Google+
- ☐ LinkedIn
- ☐ Online Publications
- ☐ Research Gate
- ☐ Twitter
- ☐ University Directory
- ☐ Website - Workplace
- ☐ Website - Personal
- ☐ Zoom Info
- ☐ Online CV
- ☐ Other

Online Presence/Media

93. Personal Website URL(s):

94. Twitter Handle:

95. Videos/Podcasts URL(s) - Youtube, TedTalks, Recorded Lectures, etc

96. Newspaper/Magazine/Website Articles URL(s):

97. Notable Graduate:

- ◯ Yes
- ◯ No

98. If a Notable Graduate, list position(s):

99. Comments: