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THE CAREER ARC OF GENETIC COUNSELORS:
TRENDS, TRANSITIONS, AND MOTIVATIONS

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Abstract

The field of genetic counseling has evolved much since the first graduate program in genetic counseling was founded in 1969 and the profession has quickly become one of the fastest growing in the country. There exists prior research on job satisfaction and recent career trends of genetic counselors; however, there have been only limited attempts to chronicle genetic counseling career arcs to our knowledge. By surveying alumni from the Joan H. Marks Graduate Program in Human Genetics at Sarah Lawrence College, our study participants include genetic counselors who have been in the field from the earliest days of the profession. More than 200 unique responses were collected with representation from all but four graduating classes in the history of the program. The plotted career arcs illuminate the overall professional landscape of genetic counseling - past, present, and future. Furthermore, this study connects experiences prior to graduate school with initial post-graduate job choices, highlights factors influencing genetic counselors’ perceived preparedness, demonstrates motivations behind job transitions, and grants important insight into the values at play in crafting a genetic counselor’s career. The research outcomes offer a glimpse into how formal training programs or professional societies may better equip the workforce to navigate an ever-changing field, as well as how institutions may support the workforce by adjusting policies to better align with genetic counselors’ top values.

Keywords: genetic counselor, career arc, professional landscape, transition motivations, workforce, Joan H. Marks Graduate Program in Human Genetics (JHMGPHG)
The Career Arc of Genetic Counselors: Trends, Transitions, and Motivations

The field of genetic counseling has evolved much since the first genetic counseling graduate program was founded in 1969. What began as a new profession for “married women in their 30s with two to four children living at home” (Stern, 2009, p.3) has quickly become one of the fastest growing professions in the country. According to the American Board of Genetic Counseling, nearly 5000 genetic counselors were board certified as of 2019, an increase of 68% over the number in 2009. Additionally, a 2017 study estimated a 72% increase in the total number of genetic counselors through 2027 (Hoskovec et al., 2017). According to the U.S. Bureau of Labor Statistics, the growth rate for genetic counseling jobs is predicted to be 27% over the years of 2018-2028 (Bureau of Labor Statistics, 2019).

While the profession began with a focus on prenatal services, genetic counselors now work in many different specialty areas, including cancer, pediatrics, neurology, cardiology, metabolic disease, and pharmacogenetics. This expanded scope of practice has led to work in an array of different workplaces, including hospitals, university medical centers, laboratories, biotech companies, private practice, non-profits, and government organizations. Many genetic counselors have branched out even more from traditional clinical roles to work in research, education, administration, public health, public policy, and marketing (National Society of Genetic Counselors [NSGC], 2019). These opportunities have been borne out of significant and rapid advances in genetic and genomic technology, growing public interest and awareness, and an otherwise under-prepared healthcare workforce (Hoskovec et al., 2017).

Roles genetic counselors play in the workforce nowadays can be divided into two major types, clinical and nonclinical, with those in clinical roles generally spending most of their time providing direct patient care (Cohen & Tucker, 2018). According to the 2019 Professional Status
Survey conducted by NSGC, 57% of respondents had positions that involved direct patient care, 26.8% had positions that involved non-direct patient care, and 16.2% had roles that involved a mix of direct and non-direct patient care (NSGC, 2019). While “nonclinical” has traditionally been used synonymously with laboratory positions, there are increasing numbers of nonclinical positions that are not situated in laboratory settings (Field, 2016).

While there is job data, there has been little research into the actual career arcs of genetic counselors, especially since the field is still relatively new and relatively small. Comparisons to other healthcare positions can be helpful when investigating careers and job transitions, but the utility of this approach is limited given that genetic counselors have unique positions in a variety of environments, some of which are areas where no other healthcare professionals practice. However, there are recent studies that provide a framework for investigating the career arcs of genetic counselors in order to determine the motivations behind career and job transitions.

Complementary to formal genetic counseling graduate training, each individual has their own life experiences that influence their education and career choices. Some studies in other healthcare disciplines have shown differences between the clinical training experiences of students that have and do not have relevant work experiences before starting a training program. In the medical field, it has been shown previously that mature students not only are more likely to draw on their previous experiences to aid in the stressful transition of moving from theory to practice, they also have higher academic achievements and personal development during medical training. It has been theorized that mature students fare better because they have more experience of cognitive restructuring and advanced moral development (Shaklady, Holmes, Mason, Davies, & Dornan, 2009). Similarly, adult learners who have worked as physical therapy assistants achieve higher clinical proficiency in the physical therapy field, when compared to those who do
not have such experiences. It is thought that the more similar past work experiences are to the new learning experience, the more successful the outcomes are (George, 2007). Research also shows that nursing students find advantages to having previous healthcare experience and report a higher level of preparedness upon starting new jobs (Rea, 2015) and that prior clinical experiences lead to a more positive transition from student roles to clinical professional roles (Kenny, Nankervis, Kidd, & Connell, 2012). However, some studies in the nursing field contradict these findings, indicating that nursing students who are older, have prior work experiences in the healthcare field, or have worked with a certain population, are not more confident or competent than their peers (Skoglund, Holmström, Sundlar, & Hammar, 2018). Moreover, prior healthcare work experiences are also reported to have positive impacts on starting wage and salary growth for registered nurses (Yoo et al., 2016). Similar studies for genetic counselors have not been conducted, but it can be reasonably assumed that professional experiences before graduate school may impact clinical training while in school, as well as preparedness for and choice of first job after completing a genetic counseling training program.

There is limited research regarding job preparation over the course of a genetic counselor’s career. However, it is known that genetic counselors rely on continuing education (CE) and are required to accrue a certain amount of continuing education units (CEUs) in order to maintain certification. CE after formal training is utilized in many other healthcare disciplines as well, such as pharmacy, nursing, and medicine (Manley, Martin, Jackson, & Wright, 2018). Previous studies have shown mixed feelings among practicing genetic counselors regarding whether they find the genetic-counseling-specific CE options useful, or whether they only seek out these opportunities to gain required CEUs. Additionally, many find CE opportunities
inaccessible, due to convenience or affordability, which affects the type of CE opportunities they participate in (Johnson, Shiles, & Boisjoli, 2018).

In addition to prior experiences and preparedness, a main factor that influences an individual’s career path, is job satisfaction. Recent satisfaction studies, both on the state and national levels, have indicated that a majority of genetic counselors are satisfied in their current positions (Cohen & Tucker, 2018; NSGC, 2018). Respondents in these studies indicate they are most satisfied with their current job in areas of autonomy, flexibility, and a sense of team, and least satisfied in areas of feeling valued by their organization, salary/benefits, and advancement opportunities. Although approximately 96.7% of genetic counselors report being somewhat (41.4%) or very (55.3%) satisfied in their current position, 63.7% of genetic counselors indicate they think about leaving their current job, with 32.4% thinking about it at least once a month. Working in a clinical setting and providing direct patient care is linked with more frequent thoughts of leaving a current position, but years of experience are not associated. Moreover, genetic counselors indicate that higher salary, better benefits, opportunities for advancement, and decreased workload are factors that would draw them away from their current position (Cohen & Tucker, 2018).

Recent studies find notable trends where genetic counselors transition from clinical settings and direct patient care to laboratory and other non-traditional roles, and where recent graduates change positions more often than earlier graduates (Cohen & Tucker, 2018). A majority of recent graduates currently in clinical roles as well as a majority of current students plan to work in a non-clinical role during their career (Liberman, 2016). Indeed, those in non-clinical positions report greater job satisfaction on average than those in clinical positions, despite both groups being satisfied overall (Kaneko & Rigobello, 2017). Factors such as
increased staff/supervisor support, ability to work from home, genetic counseling assistant support, reduced caseload, support for CE, more competitive salary, and implementation of an advancement program might influence non-clinical genetic counselors to pursue a clinical role or clinical genetic counselors to consider staying in a clinical role longer (Kaneko & Rigobello, 2017). Existing literature appears to suggest that job satisfaction influences the career arc of genetic counselors, but high overall job satisfaction does not necessarily determine the length of time an individual will stay in a particular job.

It is clear that genetic counselors, at their core, pursue work that is consistent with their values. Much psychological research has been done to describe how people use their values to provide standards of behavior, especially in regards to how people interact with their jobs (Rokeach, 1973; Super, 1990; Brown, 1995). Values are integral to overall satisfaction and goal-setting and provide an ideal state of being for an individual to work towards. In order for a job to be satisfying, it must be one in which an individual engages in activities they believe are worthwhile and must allow them to favorably compare themselves to others. Therefore, when individuals are pursuing their first job, or are making a job or career transition, they are ultimately looking for a job that will better satisfy their values (Super, 1990). The values themselves are important, but the decisions individuals make depend more on how the individual prioritizes them (Rokeach, 1973).

The importance of values is perhaps no more relevant than in the realm of salary. If workers value wealth or financial security, a job that is financially rewarding will likely satisfy them. It is not surprising to find that many individuals in the workforce, genetic counselors included, pursue jobs that are financially rewarding. Several studies have found that richer people, on average, report higher subjective well-being (Blanchflower & Oswald, 2004;
Easterlin, 2001). These studies have shown that the relationship between income and happiness proves to be statistically significant. This relationship is nonlinear in that an increase in income does not yield a proportional increase in happiness (Frey & Stutzer, 2002). It has been estimated that the income at which salary no longer becomes a factor in happiness, or “income satiation”, in the U.S. is around $105,000 for a single person household (multiply by the square root of the family size for larger households) (Jebb et.al, 2018). Above $105,000, happiness level, or “life evaluation”, was found to be unchanged with further increase in salary. Therefore, while differences in income explain only a small proportion of the differences in happiness among people (money alone does not buy happiness, per se), it can be reasonably assumed that this relationship is relevant, especially when it relates to job transition and turnover.

This relationship between salary and happiness is further complicated by the fact that individuals compare themselves to their peers. It has been found that one’s income relative to others’ is actually more important than the absolute level of income, and that their position relative to their aspirations based on these comparisons can affect their overall happiness and job satisfaction (Duesenberry, 1949; Clark & Oswald, 1996). As has been shown in previous studies, knowledge of salary differences between peers can negatively affect job satisfaction and increase job search intentions and turnover (Card, Mas, & Moretti, 2012). It can be inferred by these studies that turnover may be less related to overall job satisfaction and more influenced by the value that individuals place on being satisfied with their salary. Indeed, as indicated previously, one of the main reasons genetic counselors change positions is due to salary and/or benefits, despite being satisfied with their job overall (Liberman, 2016; Kaneko & Rigobello, 2017; Cohen & Tucker, 2018).
While salary comparisons affect job satisfaction, that satisfaction - and potentially associated turnover rate - is linked to whether workers feel they are getting proper return on investment for their time and skills (Hamermesh, 2001). Studies of primary care physicians and nurses have found that workload, not salary, has the strongest influence on job satisfaction. Primary care physicians complained of overwork/excessive hours, paperwork/administration, and excessive stress (Appleton, House, & Dowell, 1999), whereas hospital nurses mentioned low morale, management issues, workload, and the amount of time spent on non-nursing tasks (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). These studies indicate many healthcare workers feel unsatisfied with their compensation, not only as reflected in salary level, but also in regard to disproportionate investment of effort and time.

For genetic counselors, there has been an increase in workload and risk of burnout over the past two decades (Dexter, Shannon, Wangh, & Rintell, 2003; Bernhardt et al., 2009; Johnstone, 2016). Contributing factors to this burnout include inadequate support staff, high workload, inadequate autonomy, challenges inherent to the clinical setting generally, and compassion fatigue/stress. These factors led over half of surveyed genetic counselors to report thoughts of leaving direct patient care, nearly four times that of genetic nurses (Bernhardt et al., 2009). According to the 2014 Professional Status Survey, 35% of genetic counselors who had left or were considering leaving the field cited burnout as one of their primary reasons (NSGC, 2014). Changes in the landscape of the profession over the past decade - including advancing technologies, increasingly complex testing options, and highly increased patient volumes - have increased workload and put genetic counselors at higher risk for burnout and eventual job transition. According to NSGC, patient volume has significantly increased at many institutions while staffing has mostly remained the same (NSGC, 2016). Additionally, clinical genetic
counselors transitioning to non-direct patient care roles has strained those who remain in direct patient care roles, further exacerbating the risk for burnout, especially in geographic areas where clinical genetic counselors are already sparse (Liberman, 2016).

Cited as a factor for burnout for genetic counselors is something known as “compassion fatigue,” describing a state of detachment and isolation experienced by healthcare providers when they repeatedly engage with patients in distress (Joinson, 1992). If not managed effectively, compassion fatigue can degrade patient care, reduce job satisfaction, and increase job turnover due to psychological stress (Sprang, Clark, & Whitt-Woosley, 2007). Previous studies have shown that a significant majority of genetic counselors are at moderate to high risk for compassion fatigue, and that it is a major factor in their thoughts about leaving the field (Injeyan et al., 2011; Lee, Veach, MacFarlane, & LeRoy, 2015). This research suggests that risk for job transition related to burnout or compassion fatigue connects to, but is ultimately independent of, salary. This has been shown in the nursing field as well, where market wage rate did not influence turnover significantly, but workplace conditions and overall workload did (Brewer et al., 2006).

Adjacent to job transition motivations are retirement motivations. Due to the relative brevity of the field, there is currently a lack of research on retirement patterns of genetic counselors. In the nursing field, however, there is a drastic increase in the number of nurses retiring starting at age 60, as opposed to age 62, the average age of retirement in the US. Decisions about when to retire appear to depend more on personal characteristics of registered nurses than job characteristics. Some personal characteristics that play a role in when a nurse decides to retire include health, income, marital status, gender, wanting more time with family, and disability status (Nooneya, 2010).
Although there is some research into the motivations of the career arcs of genetic counselors and the evolution of the workforce as a whole, there is clearly a need for more extensive research in this area. It has been found that individuals make job transitions for many different reasons, including salary, opportunities for advancement, and workload, as described above. Genetic counselors make job transitions to better align with their values and their prioritization of these values, but the actual sequence of jobs in a genetic counselor career arc has not been fully defined or adequately studied. Research described above discusses recent trends of genetic counselors transitioning to non-clinical roles, but further research is needed to determine how various factors such as values or years of experience affect this job sequence. The Joan H. Marks Graduate Program in Human Genetics (JHMGPHG) at Sarah Lawrence College has the longest-standing, largest, and most widespread alumni base of any genetic counseling training program, and therefore is a unique reference group for this research. This investigation into the career arcs of Sarah Lawrence College genetic counseling alumni grants important insight into the values, motivations, and decisions at play in the arc of a genetic counseling career. Documenting trends of job sequence and transitions informs better ways to equip and support genetic counselors at their current and future institutions.

**Materials and Methods**

**Recruitment**

The eligibility criteria required that participants were graduates of JHMGPHG at Sarah Lawrence College. Survey participants were recruited from a list of alumni from classes 1971 through 2019. An invitation with a link for participation in the survey was emailed to a total of 649 alumni for whom there were emails on record with the program. Two reminders to participate in the study were sent by email after the initial notice, one a week after the survey
opened and the second the day before the survey closed. Participants were not compensated for their participation in this survey.

Data Collection

A survey tool was created using SurveyMonkey. While the full survey included 394 questions, skip logic was utilized to allow flexibility for unique career arcs so the number of questions each participant answered depended on how many post-graduate jobs they reported. The average number of questions an individual actually answered to complete the survey was 59. The survey tool was considered exempt by the Institutional Review Board at the College and was open from February 17 through March 2, 2020. Survey questions were predominantly in the format of multiple choice, Likert scale style, with limited open text fields. Questions included demographics and features of each job held in the career of each participant. A position, by authors’ definition, also included promotion or a change in primary specialty within the same institution/company. For each position, participants were asked about primary specialty, role, setting, time spent, preparedness, and motivations for leaving. The results of this survey were held on a password protected website linked to the survey itself. At the request of one participant, one survey was completed over the phone and was incorporated into the dataset.

Data Analysis

Due to considerable variability in the number of post-graduate jobs and length of time spent in each, responses were analyzed to illustrate overall trends considering all reported jobs and considering each respondent’s first job after graduation. Information captured on partially completed or disqualified surveys was excluded from the overall trend of career arcs and the analysis of transitions. Descriptive statistics were calculated using Microsoft Excel. For tests of statistical significance, Fisher’s exact two-tailed P value was calculated from a 2x2 contingency
table using GraphPad (https://www.graphpad.com/quickcalc/contingency1). This survey included one short answer style question and several free text options as answer choices marked by the title “other (please specify).” Relevant and/or recurrent responses were tallied and indicated in the results.

**Results**

A total of 204 unique responses were collected out of the 649 alumni contacted, a response rate of 31.4%. Of these responses, 197 were complete (two of which were disqualified due to misinterpretation of the survey questions and thus excluded from most analysis, see Study Limitations) and seven were partial in that information was provided on at least their first post-graduate job. Among all respondents, a total of 503 jobs were collected, of which 467 (92.8%) were *related to genetic counseling* (GC) and 36 (7.2%) *not related to genetic counseling* (NGC).

**Demographic Information**

Respondents collectively represented 45 of 49 graduating cohorts of the JHMGPPhG. Stratified by decade, 7.8% (16/204) of respondents graduated between 1971-1980, 11.8% (24/204) between 1981-1990, 15.7% (32/204) between 1991-2000, 24.0% (49/204) between 2001-2010, and 40.7% (83/204) between 2011-2019. The vast majority of respondents (87.3% [178/204]) were between the ages of 19-29 and held a bachelor’s degree (88.2% [180/204]) when they began their genetic counseling graduate studies; 11.3% (23/204) reported having previously earned a master’s degree and 0.5% (1/204) had earned a doctoral degree. Of all prior degrees, 68.6% (140/204) were in a GC field and 31.4% (64/204) were in an NGC field. Seven respondents (3.4%) indicated they received a doctoral degree since graduating from JHMGPPhG.
Prior Work Experiences

All participants (n=204) were asked if they worked between graduating from their undergraduate program and entering JHMGPHG, how long they worked, and the nature of their work: 29.4% (60/204) of respondents reported they did not work before entering JHMGPHG, whereas 70.6% (144/204) of respondents reported having prior work experiences, with the employment duration ranging from less than 1 year to 25 years (average=4.1, median=2). Of respondents with work experience prior to genetic counseling graduate training, 72.9% (105/144) worked in a field related to healthcare, science, or the laboratory industry (of whom 41% [43/105] considered the position to be patient-facing) and 27.1% (39/144) worked in a field not related to healthcare, science, or the laboratory industry (of whom 25.6% [10/39] considered the position to be patient-facing). Of all respondents with prior work experiences, 18.1% (26/144) considered the position to be higher than entry-level, and 4.2% (6/144) held positions in various management levels.

Career Arc and Professional Landscape

To illustrate career arcs - including work experiences prior to genetic counseling graduate training, sequential jobs following graduation from JHMGPHG, and plans for future transitions - each survey response was plotted with color-coded experiences/jobs from 1973 through 2020 (Figure 1). Multiple points of data were used to lay out each individual arc, including age of starting a position and duration of a position. Incomplete or discrepant surveys were removed from arc analysis.

Of the 192 individuals whose career arcs were plotted, 11 either reported having only one post-graduate job before having reached retirement or were still in their first post-graduate job and planned to retire after this position. The length of their first job to date ranged from 7 to 39
years (average=29.1 years, with 9/11 currently in their first job). 128 respondents who moved beyond their first post-graduate job spent 3.9 years on average at their first jobs (range=1 to 36 years, median=2 years) and 6 years on average at their second jobs (range=1 to 33 years, median=4 years, with 47/128 currently in their second job). Thirty-seven respondents whose first post-graduate job lasted 1 year or less went on to spend an average of 5.3 years in their subsequent jobs (range=1 to 23 years, median=4 years). When these 37 respondents were considered individually, they spent an average of 8.1 years as the longest period of time at one of their subsequent jobs. When the recent graduates (2016-2019) were discounted, the remaining 30 respondents were found to stay an average of 9.4 years as the longest period of time at one of their subsequent jobs (range=4 to 23 years, median=8 years).

The right column of Figure 1 illustrates the future plans of the cohort. Plotted career arcs of 192 individuals were divided into three graduation groups for analysis: classes 1971-1995, classes 1996-2014, and classes 2015-2019. The first group represents the first half of chronological graduating classes (46 respondents). In order to evaluate trends more specifically, the second half of chronological graduating classes (146 respondents) was further divided into two groups: the middle 19 classes (89 respondents) and the most recent 5 graduating classes (57 respondents). Of those in the first group (46/192), 80.4% (37/46) had either retired or planned to retire after the current position. Of those in the middle group (89/192), 57.3% (51/89) planned to transition to an indirect patient care position in their next job, 23.6% (21/89) planned to transition to a direct patient care position, and 13% (12/89) had either retired or planned to retire after the current position. Of those in the third and most recent group (57/192), 49.1% (28/57) planned to transition to a direct patient care position in their next job and 43.9% (25/57) planned to transition to an indirect patient care position. Furthermore, 60% of the most recent graduates
who indicated they planned to move to an indirect patient care role in their next job (15/25) were currently at their first job at the time of the survey.

**Figure 1**

*Career arc of 192 respondents*

*Note.* Each row represents a unique individual followed throughout the calendar years with sequential positions color-coded. Light grey preceding red (first post-graduate job) indicates work experience prior to JHMGPHG. Future plans are illustrated on the right side in a column.
Using the plotted career arc of 192 individuals, GC specialties from 1973 through 2020 were plotted. Figure 2 illustrates the specialty trend among respondents by counts (a) and percentages (b) in a given year. Pediatric/general genetics (light blue) and prenatal genetics (salmon pink) made up the majority of GC specialties in any given year before 1989, whereas cancer genetics (gray) emerged in 1992 and evolved into the most indicated specialty in 2020 (19.5%), followed by prenatal genetics (18.4%) and pediatric/general genetics (14.4%). The growth of both industry (yellow) and laboratory (royal blue) positions is also evident; first indicated by respondents in 1990 at 3.0%, these specialties grew to a combined 16.1% in 2020. The number of genetic counselors practicing in prenatal genetics increased gradually throughout the years, yet the overall percentage decreased as a wide variety of specialties became available due to developments in the field. These newer, more specialized positions can be visualized by the many colors in the top right corners of the figure. While prenatal, cancer, and pediatric/general genetics continue to be the most common GC specialties, 47.7% of respondents working in 2020 indicated they were not working in these three areas.

First Post-Graduate Job Specialty Trends

All participants were asked if each post-graduate position was in the field of genetics/genetic counseling by their own definition. For first jobs, 96.5% (195/202) of respondents indicated they had GC jobs, while 3.4% (7/202) did not. Primary specialties for first post-graduate GC jobs were stratified by decade of graduation year for analysis and is illustrated in Figure 3.

Of respondents from the first ten graduating classes (1971 through 1980), 40.0% (6/15) had their first job in pediatric and/or general genetics and 20.0% (3/15) had their first job in prenatal. An increase in prenatal specific first jobs (43.5%, 10/23) and a decrease in pediatric
Figure 2

Yearly specialty trend of 192 plotted respondents: Total count (a) and percentage (b) in the field from 1973 to 2020
and/or general genetics first jobs (21.7%, 5/23) was seen for respondents who graduated in the second decade (1981 through 1990). By the third decade (1991 through 2000), cancer genetics started to increase in popularity (12.5%, 4/32) while prenatal continued to be the top first-job choice for graduates (40.6%, 13/32). Only 12.5% (4/32) of respondents from this group chose pediatric/general genetics as their first job specialty, continuing the downward trend from the previous decade. In 2000 and beyond, a variety of first-job choices started to emerge, including cardiovascular, metabolic, ART/infertility, laboratory, and industry positions. These specialties accounted for 16.3% of first jobs in the 2000s (8/49) and 10.8% of first jobs in the 2010s (9/83). Meanwhile, first jobs in cancer genetics grew to 22.4% in the 2000s (11/49) and held at 21.7% in the 2010s (18/83), while prenatal also held steadily – 32.7% (16/49) to 36.1% (30/83) in the

Figure 3

First post-graduate job specialty choice trend in percentage, divided by decade
same time period. Pediatric/general genetics saw an increase to 24.1% (20/83) among graduates' first-job choice in the 2010s, after two decades of lower representation.

**Future Specialty Trends**

All participants who were currently working in a GC job (181/195) were asked if they plan to transition to a new position in the future and what type of patient care this new position would ideally provide: 27.6% (50/181) planned to transition to a direct patient care role in their next job, 44.8% (81/181) to an indirect patient care role, 4.4% (8/181) to a NGC role, and 23.2% (42/181) planned to retire. Respondents currently in a GC job (181/192) who planned to transition to a future GC job (130/181) selected a range of desired future specialties: cancer genetics (16.9%, 22/130), industry (14.6%, 19/130), laboratory (13.1%, 17/130), education (10.8%, 14/130), prenatal (10%, 13/130), and pediatric/general genetics (8.5%, 11/130). Some respondents (14.6%, 19/130) indicated a specialty in the “other” category, with the most common response being “I don’t know” (Appendix Table A1). When these responses were excluded from analysis, there were 111 respondents currently in a GC job, who planned to transition to another GC job, and had indicated a GC specialty for that future position. Of these, 45.0% indicated plans to transition to industry, laboratory, or education (50/111), specialties authors deemed inherently to provide indirect patient care. The remaining respondents indicated typically clinic-based specialties, of which the primary three were cancer (19.8%, 22/111), prenatal (11.7%, 13/111), and pediatric/general genetics (9.91%, 11/111). Of the respondents who indicated they wanted their next job to be in the cancer specialty, 54.6% (12/22) indicated they wanted to transition to an indirect patient care role. In contrast, only 23.1% (9/39) of the respondents who indicated they wanted their next job to be in other clinic-based specialties (39/111) indicated they wanted to transition to an indirect patient care role. Therefore,
respondents whose future plans were in cancer specialties were more likely to desire indirect patient care in their next job than those in all other listed specialties, excluding laboratory, industry, and education (p=0.026).

**Preparedness Trends**

In addition to features of a position such as salary and title, all participants were asked how prepared they perceived themselves to be for each position, considering factors such as previous work/general life experiences, JHMGPHG training, and CE. Participants were also asked whether they felt they had to learn significantly on the job for each position. These preparedness questions were answered on 5-point Likert scales.

**First Job Preparedness**

Among all qualified responses, 70.8% (143/202) felt that their previous experiences were helpful in preparing them for their first job (24.3% strongly agreed, 46.5% agreed). When prior work experiences were taken into consideration, 74.8% of the 143 respondents who worked before entering JHMGPHG felt that their previous experiences were helpful in preparing them for the first post-graduate job (24.5% strongly agreed, 50.3% agreed), compared to 61% of the 59 respondents who did not (23.7% strongly agreed, 37.3% agreed). Respondents with prior work experiences were somewhat more likely to feel previous work or general life experiences prepared them for the first post-graduate jobs, as compared to those without (p=0.0613). However, no statistical significance in perceived preparedness was observed when numbers of years of prior work experiences were taken into consideration: at least 2 years (p=1.000), at least 3 years (p=1.000), or at least 4 years (p=0.2651). Moreover, the type of prior work experiences, in terms of whether it was in a healthcare/science/laboratory industry or whether the role was
patient facing, also did not appear to influence how people felt about their preparedness at the first post-graduate jobs (data not shown).

Median ages upon entering JHMGPHG and starting the first post-graduate job among respondents were 24 and 26, respectively. Respondents generally felt that their overall life or work experiences were helpful in preparing them for the first post-graduate job regardless of age groups: 68.3% of those who were 24 years old or younger (84/123) and 74.7% of those who were at least 25 years old (59/79) upon entering the program. A nearly identical trend was observed when age of starting the first job was considered (26 years old or younger compared to at least 27 years old, data not shown). Neither age upon starting graduate study (p=0.3466) nor age when starting the first post-graduate job (p=0.4311) seemed to influence whether respondents felt their general life experiences prepared them for the first post-graduate job. Moreover, 73% of the 23 respondents (17/23) who already received graduate-level education before entering JHMGPHG felt that their overall life or work experiences were helpful in preparing them for the first post-graduate job, compared to 70.4% of the 179 respondents (126/179) who completed undergraduate studies (p=0.812). Lastly, areas of study, whether previous degrees were in a GC field, also did not reveal any statistically significant trend in preparedness at the first post-graduate jobs (p=0.868).

For their first post-graduate jobs, 89.1% of respondents felt that JHMGPHG prepared them (42.1% strongly agreed, 47.0% agreed). Additionally, 69.3% indicated they needed to learn significantly on the job (23.3% strongly agreed, 46.0% agreed). Analysis of perceived preparedness as a result of JHMGPHG training by graduation year, work setting, and type of role did not show significant differences (data not shown).
Career-long Job Preparedness

Overall, respondents reported that JHMGPHG prepared them for GC jobs 77.3% of the time (31.8% strongly agreed, 45.5% agreed) and NGC jobs 45.5% of the time (6.1% strongly agreed, 39.4% agreed), while their overall work or life experiences prior to entering JHMGPHG prepared them for GC jobs 65.2% of the time and NGC jobs 54.6% of the time. Figure 4 shows that preparedness due to previous experience and JHMGPHG education decreased gradually as respondents moved from their first to subsequent jobs, while CE prepared respondents 36.4% to 43.1% of the time during the first four post-graduate GC jobs. The number of GC jobs from the fifth job onward (≤19) were too small for trend analysis.

Figure 4

Self-perceived preparedness by prior work/life experiences, JHMGPHG training, and supplementary CE from first to fourth post-graduate GC jobs, all GC jobs, and NGC jobs
Despite feeling prepared for their post-graduate positions, some respondents still felt they needed to learn significantly on the job. The rate fluctuated as respondents moved from their first (24.1% of 195 jobs answered “strongly agree” to the statement) to second (19.2% of 125 jobs), third (33.3% of 72 jobs), and fourth (27% of 37 jobs) post-graduate jobs. The majority of the time (82.3%, 93/113) when respondents answered “strongly agree” to the statement, it was when they either switched specialties or moved from GC to NGC jobs.

**Motivations for Job Transition**

All participants who had left at least one post-graduate job (127/195) were asked to indicate their primary (strongest) motivations for leaving each position. Additionally, all participants currently working in a GC job who did not plan to retire after their current position (138/195) were asked what their anticipated future motivations would be for leaving their current job. Both questions allowed respondents to select all answer choices they felt were primary motivators for their job transition decision.

Figure 5 displays the primary motivations for the 127 respondents who transitioned from their first GC job, the primary motivations for all respondents who had ever left a GC job (combined jobs n=281), and the anticipated future motivations for 138 respondents currently working in a GC job who did not plan to retire after their current position. Compared to the combined past transition motivations, respondents indicated similar motivation trends for future transitions, but at significantly different percentages. Salary/benefits was a primary motivator for leaving a previous position 32.0% of the time (90/281) and an anticipated primary motivator in the future for 63.0% of respondents (87/138). This trend is similar for desiring more professional growth (34.5% combined past, 53.6% future), desiring more opportunity for career advancement (26.7% combined past, 47.8% future), and desiring more flexibility (10.0% combined past,
24.6% future). A drastic increase in responses citing burnout as a primary motivator to transition was also seen (11.0% combined past, 34.0% future).

**Salary**

All respondents were asked to estimate their starting salaries for each post-graduate position, adjusted for inflation to what their salary would be at the time of the survey. Salary was reported in a multiple choice format where options were provided in $10,000 increments, from $65,000 to $145,000. Options for <$65,000 and >$145,000 were also included.

**Salary of First Job After Graduation**

To determine whether work experiences prior to genetic counseling graduate training had an impact on the starting salary of respondents’ first GC job, analysis was limited to the most

**Figure 5**

*Motivations for leaving past GC jobs or any current jobs*
recent five graduating classes (classes 2015 through 2019, 57/195), in an attempt to restrict
individual interpretations on inflation and dollar value. Among 57 recent graduates, 12.3% (7/57)
had a starting salary of less than $65,000 at their first post-graduate GC job, of whom 42.9%
(3/7) had prior work experiences. Over a-thirds of these recent graduates (36.8% [21/57]) had a
starting salary between $65,001 and $75,000, of whom 52.4% (11/21) had prior work
experiences. Another one-thirds (35.1% [20/57]) had a starting salary between $75,001 and
$85,000, of whom 80.0% (16/20) had prior work experiences. Lastly, 15.8% (9/57) had a starting
salary over $85,001, including three individuals making more than $95,001; all of these
graduates (9/9) had prior work experiences. Respondents with prior work experiences were more
likely to have a starting salary of $75,001 or higher as compared to those without (p=0.0045).

Although prior work experiences positively impacted starting salary for first post-
graduate GC jobs, having prior work experiences or the numbers of years of experiences did not
always correlate to higher pay. Using job title (Genetic Counselor vs. Senior Genetic Counselor
or Manager) to analyze the entire study cohort, 71.9% of respondents with a Senior Genetic
Counselor title in their first post-graduate jobs (23/32) had prior work experiences ranging from
1 to 20 years, and 81.8% of respondents with management titles at their first post-graduate
positions (9/11) had prior work experiences ranging from 1 to 10 years. However, having prior
work experiences before entering JHMGPHG did not seem to have a direct impact on the job
titles of the first post-graduate positions as compared to those without (p=0.7043 when
comparing Genetic Counselor vs. Senior Genetic Counselor).

**Salary-Based Transition Motivations**

When participants indicated salary/benefits as one of their primary motivations for
leaving any positions, they were then asked if this was their number one reason for leaving, and
whether they would have stayed longer had salary/benefits been satisfactory in that specific
position. For those who left first GC jobs, 13 of the 47 (27.7%) respondents indicated
salary/benefits was the number one motivation for leaving the position, and 53.9% of them
(7/13) would have stayed longer in this position if salary/benefits had been satisfactory. On the
other hand, only 14.7% (5/34) of the respondents who included salary/benefits as one of their
motivators but was not their number one reason for leaving their first GC jobs, would have
stayed longer if these factors had become satisfactory. Similarly, when transition motivations
were analyzed across all previous GC jobs, salary/benefits was listed as one of the motivations
for 90/281 positions and as the number one motivation for 26/90 (28.9%). Half of these
respondents for whom salary was the number one motivation (50%, 13/26) would have stayed in
their position longer if these factors had been satisfactory, while 17.2% (11/64) of the
respondents who indicated salary/benefits as a motivator but not the number one reason for
leaving would have done the same. Those who indicated salary as their number one reason for
leaving a position were more likely to have stayed at their position than those who indicated
salary was not their number one reason (p=0.0031). In all, 26.7% (24/90) would have stayed
longer in their position if these factors had been satisfactory.

Starting salary for 137 respondents currently employed in GC jobs or NGC jobs who
included salary/benefits as one of their anticipated motivations for transition to a future job was
compared between those for whom it was one of the motivations (84/137) and those for whom it
was not (53/137). Respondents with starting salaries of $85,000 and under were significantly
more likely to include salary/benefits as one of their primary motivations than those with starting
salaries of higher than $85,001 (p=0.0073). As starting salary increased, respondents were less
likely to include salary/benefits as one of their motivations to transition to a future job (p=0.05 for salary cutoff of $95,001, and p=0.0558 for salary cutoff of $105,001).

**Promotion and Career Advancement**

For each GC job, all participants were asked to indicate if they considered their role to be entry-level (e.g. Genetic Counselor), senior-level (e.g. Senior Genetic Counselor), mid-level management (e.g. Supervisor or Direct Report), director-level management (e.g. Manager/Director), or executive-level management (e.g. C-suite). Movement from entry-level to higher levels over time is illustrated in Figure 6, alongside the average length of time an individual spent in an entry-level position before transitioning to either another entry-level position or advancing to a higher level position. This analysis only includes respondents who started out with a first post-graduate GC job (n=171) and does not account for respondents who advanced to higher levels but returned to entry-level later in their careers. Most respondents (152/171) indicated they had an entry-level position in their first GC job. A total of 104 respondents transitioned from an entry-level first GC job, of those 55.8% (58/104) remained entry-level in the next GC job and 44.2% (46/104) advanced to a higher level position. Those who remained entry-level spent 3.7 years on average in an entry-level first GC job, while those who advanced in their second GC job spent 8.7 years on average at an entry-level position. Of those who advanced, 17.4% (8/46) transitioned to a management position. Including first through fourth GC jobs, those who advanced in a subsequent job spent 1.4 to 2.4 times longer on average at an entry-level position than those who did not advance in a subsequent job.

The highest level of advancement was recorded for each of the 204 respondents, including the seven incomplete responses for their first job only: 37.7% (77/204) entry-level contributor, 34.8% (71/204) senior-level contributor, 9.3% (19/204) mid-level management,
15.2% (31/204) director-level management, and 2.9% (6/204) executive-level management. To contrast these numbers, 62 respondents who were currently in their first job at the time of taking the survey, and therefore have not had an opportunity for advancement in a subsequent job, were excluded. The highest advancement levels of the remaining 142 who have had at least two jobs were as follows: 26.8% (38/142) entry-level contributor, 37.3% (53/142) senior-level contributor, 12.7% (18/142) mid-level management, 20.4% (29/142) director-level management, and 2.8% (4/142) executive-level management. Without taking into account the length of time in

**Figure 6**

*Progression from entry-level GC positions to senior-level or management GC positions and the average length of time spent in those positions*

![Diagram](image_url)

*Note.* Numbers within parentheses indicate the number of individuals that transitioned to the next sequential job. This does not include people who started out with NGC jobs, nor does it indicate “regression” from higher level to entry-level GC positions.
a job or in the field, 64.1% (91/142) of genetic counselors who have had at least two jobs did not advance to management-level, and of those, 41.8% (38/91) remained entry-level. For each GC job, all participants were asked to indicate if a system for promotions or advancement was available to them. When all 468 reported GC jobs were considered together, there were a total of 149 (31.8%) “Yes” responses and 319 (68.2%) “No” responses. Using criteria defined by authors (Appendix Table A3), 362/468 (77.4%) jobs were designated “traditional” roles/settings and 106/468 (22.7%) jobs were designated “non-traditional” roles/settings. It was determined that 26.2% (95/362) of designated “traditional” jobs had advancement systems in place for genetic counselors, while 73.8% (267/362) did not, and 50.9% (54/106) of designated “nontraditional” jobs had advancement systems in place for genetic counselors, while 49.1% (52/106) did not. Systems for promotions and/or advancement for genetic counselors were significantly more likely in “non-traditional” roles/settings than “traditional” roles/settings (p<0.0001).

**Side Jobs**

Participants were asked to indicate secondary or part-time positions in the form of free text comment boxes, in addition to the primary position during the same period of time. Nearly one-thirds of respondents (31.7%, [64/202]) indicated they had a secondary position or function concurrent to at least one position; 20 individuals had secondary positions during two or more positions. When all 503 jobs were considered, respondents reported having a secondary position 18.9% of the time (95/503). The average age upon starting the first, second, and third post-graduate job for these individuals when they held secondary positions was 29.5, 32.6, and 35.9, respectively, while the proportion of respondents who held a secondary position during those jobs was 16.8% (34/202), 20.3% (27/133), and 24.4% (18/82), respectively. To contrast, the average age of all respondents upon starting a first, second, and third post-graduate job was 27.8,
31.9, and 35.7, respectively. Therefore, not only did older respondents hold secondary positions more often than their counterparts, there was higher uptake of secondary positions as people moved on to subsequent jobs. The nature of the secondary jobs were mainly part-time genetic counseling (42/95), teaching (29/95), consulting (10/95), and writing (8/95).

**Leaving the Workforce and Retirement**

About a quarter (42/181) of the respondents currently working at the time of the survey planned to retire after their current position. The anticipated primary motivations for exiting the workforce included the logical end of their career (32/42, 76.2%), more time with friends/family (21/42, 50.0%), a desire to travel (19/42, 45.2%), more time for hobbies (10/42, 23.8%), sufficient household income (10/42, 23.8%), burnout/stress (4/42, 11.9%), and caring for a loved one (3/42, 7.14%).

Of all 195 complete responses, 17 respondents had already left the workforce at the time of the survey at an average age of 52.7 years (median = 61). The majority of them (64.7%, 11/17) did not plan to return to the workforce, eight (72.7%) of which were age 61 or older at the time of leaving. On the other hand, 35.3% (6/17) of these respondents did plan to return to the workforce, and only one (16.7%) was age 61 or older at the time of leaving. Of those planning to return to the workforce, 4/6 (66.7%) respondents planned to return to a direct patient care position, 1/6 (16.7%) to an indirect patient care position, and 1/6 (16.7%) to a NGC position.

**Discussion**

To date, there have been few studies investigating the career arc of genetic counselors. Recent studies suggest some job trends in the last decade while most work has focused on job satisfaction in the field, but to our knowledge, no research to date has attempted to chronicle career arcs for genetic counselors (Cohen & Tucker, 2016; Liberman, 2016; Kaneko &
Previous research in other healthcare disciplines often finds contradictory evidence on how life experiences, prior work experiences, and maturity in general influence the ease of transition from academic study to practical positions, partially because maturity is difficult to define and preparedness is difficult to quantify (Shaklady et al., 2009; George, 2007; Skoglund et al., 2018; Rea, 2015; Kenny et al., 2012). In this study, prior work experience, age, and degree(s) earned before entering JHMGPCHG were used as a proxy and cross-referenced with respondents’ self-perceived job preparedness at their first post-graduate jobs. In general, the majority of respondents found their general life experiences helpful in preparing them for their first post-graduate job, and people who worked prior to entering JHMGPCHG were slightly more likely to feel this way than those who did not. No other factors were found to influence this sense of preparedness. It is possible that people who worked after earning an undergraduate degree and have been in a “real-world” environment have a more realistic and holistic view of professional work than those without such exposure. Therefore, perhaps the definition of maturity in terms of professional preparedness lies in an individual’s ability to draw on previous experiences in a holistic way in facing challenging situations, such as transitions from an academic setting to a first post-graduate clinical position. This study did not otherwise provide additional insights on this subject matter, which perhaps reflects the complexity of adult learning, as influenced by education, self-motivation, and individual experiences.
Another impact by prior work experiences was the starting salary and job title of respondents’ first post-graduate jobs. Our data showed that respondents with prior work experiences were more likely to have a starting salary of $75001 or higher as compared to those without, but there was no direct correlation between prior work experiences and job titles of the first post-graduate GC position (Genetic Counselor vs. Senior Genetic Counselor). This finding aligns with previous studies in other healthcare disciplines where having prior work experiences is positively correlated to a higher starting salary (Yoo et al., 2016). However, due to limitations in survey design, reported salary data could not be used to accurately verify whether prior work experiences impact salary growth in subsequent positions.

Besides prior work experiences, JHMGPHG training and “on the job” learning influenced respondents’ sense of preparedness. While an overwhelming proportion of respondents felt that JHMGPHG prepared them in their first post-graduate jobs, over two-thirds also indicated they had to learn significantly “on the job”. It may be that while JHMGPHG prepared respondents for some or most aspects of their first job, some aspects of the jobs were either job-specific or simply could not be appropriately taught in a classroom, resulting in the need for significant adjustment. When job preparedness was tracked over time, a gradually decreasing trend was observed when respondents moved from their first post-graduate position to subsequent jobs, both in feeling prepared by the formal training from JHMGPHG and feeling prepared by their individual general life and work experiences prior to entering JHMGPHG. This trend showed that graduates gained competencies from GC job experiences and drew less from previous experiences as they moved to subsequent jobs. Moreover, despite generally feeling prepared for their jobs over time, respondents continued to feel they needed to learn significantly on the job, especially when they either switched specialties or moved from GC to NGC jobs. This highlights
the importance of life-long learning beyond formal genetic counseling training and the need for ongoing support from professional societies and workplaces after genetic counselors leave their training institutions. Interestingly, respondents felt that JHMGPHG training had prepared them for NGC jobs about half of the time. This may speak to the transferable skills that genetic counselors gain from training. Such qualities may have also facilitated the expansion of the GC professional landscape where genetic counselors are employed in many non-clinical settings and in various functions.

With the gradual shift in sources of preparedness from previous experiences, genetic counselors leverage CE for ongoing maintenance and acquisition of professional knowledge. However, less than half of the study respondents found CE useful in preparing them for their jobs. This suggests a lack of relevance or applicability of available CE content, which echoes previous studies on the topic, where genetic counselors have expressed mixed feelings regarding whether they find the genetic-counseling-specific CE options useful (Johnson, Shiles, & Boisjoli, 2018). As demonstrated, with the expanding and ever-changing GC professional landscape, it is especially crucial to provide relevant CE for genetic counselors who have transitioned or plan to transition between specialties in their career, as such transitions are accompanied by daunting learning curves. Future research might explore what factors facilitate transfer of learning from CE experiences to the actual work and practice of genetic counselors.

In addition to providing more relevant CE options, leaders of professional societies and training programs must adapt to the ongoing changes to the practice landscape of the profession. As documented in this study, genetic counseling has grown from a few specialized roles and environments into a plethora of opportunities (see Figure 2). Diverse roles are available not only to all practicing genetic counselors but also to new graduates upon starting their first jobs (see
Figure 3). This is likely due to technological advancements and improved cohesive scientific knowledge overall. For example, the identification of $BRCA1$ and $BRCA2$ genes in the mid-1990s likely pushed cancer genetics to the forefront, whereas the completion of Human Genome Project and the technological innovation and implementation of next generation sequencing made possible the common usage of gene panels and whole exome or genome sequencing in clinical practice. With new innovation and adaptation of technologies in clinical spaces, including novel gene therapies, the professional landscape will continue to evolve and expand. As exciting as it is for the future of the profession, more support is needed from the professional societies and training programs. For example, although various specialties are increasingly available throughout the years and new graduates have more options than ever, the majority of new graduates in the past decade found their first jobs in the three common clinic-based specialties (cancer, prenatal, general/pediatric). This may speak to greater availability of such positions, but may also indicate that training modules mainly focus on scenarios in these three specialties by virtue of program accreditation standards, and that new graduates found it easier to transition to a practical position if they adhered to these specialties. The first job choice may also reflect individual preferences and personal motivations from prior to entering the field. Therefore, the challenge facing the profession may be not only the shortage of practicing genetic counselors, but also heightened demand in multiple, heterogeneous areas that are yet to be developed.

Although job length for genetic counselors varies, this study shows that the average respondent with more than one job spends considerably less time at their first job than their second job (see Figure 1). This potentially points to genetic counselors mirroring trends seen in other fields, where individuals spend two years on average in a position before finding a job that
suits them more fully, where they stay an extended period of time (Barrera & Carter, 2017). This trend may be due to people’s feeling of pressure to find a first job after graduation within a specific timeframe, when their ideal job may not be immediately available. It is also likely that individuals explore workplaces and roles while on the job, which allows them to refine their values, leading them to look for one that aligns more closely with those values at a subsequent job, including perhaps, exploring a specialty outside of the common three. It is also known that some positions in more desirable institutions or cities require prior experience in the field, which new graduates must gain elsewhere through their first positions.

This study also shows that the majority of practicing genetic counselors who do not plan to retire after their current job aim to transition to non-traditional, non-clinical, and in most cases, non-patient facing specialties in their next job. In fact, the trend is evident even with recent graduates who planned to pursue indirect patient care roles earlier in their career than those from older classes (see Figure 1, right column). This could reflect an increase in both the interest and availability of indirect patient care GC roles for new graduates over time, even in their first post-graduate job. In the cancer specialty in particular, the large percentage of respondents who plan to work in an indirect patient care role in the future may suggest that they consider some opportunities in industry or laboratory as being in the cancer specialty, thus the numbers of those categories may actually be higher than reported. Or it may be that respondents perceive they can find more diverse roles within the cancer specialty such as research and treatment development, which are becoming more common due to technological advancements. Due to its prevalence in the population, public interest in research and development to combat cancer may have been the driving force for such opportunities for genetic counselors. However, this shift of interest
towards indirect patient care GC jobs may be illuminated by the primary motivations selected by respondents (see Figure 5).

The first insight from the primary motivation data was the three-fold increase in respondents citing burnout and compassion fatigue as primary transition motivators in the past to the future. This led authors to speculate that it may be a major contributing factor in drawing genetic counselors away from direct patient care GC jobs. This finding is consistent with previous studies, where genetic counselors were shown to experience high levels of burnout and higher risk for compassion fatigue, which were major factors in their thoughts about leaving the field (Johnstone et al., 2016; Injeyan et al., 2011; Lee et al., 2015). Although this study relies on respondents’ perception of their own burnout rather than the scoring criteria used in the above studies, it lends further evidence to the trend that genetic counselors are currently at more risk for burnout and compassion fatigue than they used to be, and that these factors more strongly influence job transitions.

Besides citing burnout, this study shows that genetic counselors are desiring higher salaries, better benefits, greater flexibility, and more opportunities for professional growth, expanded roles, and career advancement. These were consistently the most selected responses concerning reasons for leaving a past position and for eventually leaving a current one; the percentages in which participants selected them nearly doubled in each case when addressing future motivations. This result echoes previous research into aspects which would draw currently working genetic counselors into new positions (Cohen & Tucker 2018; Kaneko & Rigobello 2017). This indicates a shift in the prioritization of values of the current genetic counseling workforce: genetic counselors, now more than ever before, highly value these job aspects, leading many to consider leaving current positions in search of them. It is perhaps due to the
greater availability of roles with higher pay and possible career advancement that current genetic counselors desire these attributes more. The flexibility of working from home for a laboratory, for example, did not exist before the 1990s. These job attributes are often found in jobs providing indirect patient care, in specialties such as industry, laboratory, and education.

Salary was also shown to be a strong motivator for genetic counselors in this study. As described above, over a quarter of jobs left where salary/benefits were motivating factors were positions that were otherwise satisfactory, and higher salary or better benefits would have prevented turnover. Knowledge of salary differences between peers can negatively affect job satisfaction and increase job search intentions and turnover (Card et al., 2012), so it may be that genetic counselors are dissatisfied with their salary due to comparison to peers who have higher salaries. The average salary of indirect patient care GC jobs is greater than direct patient care GC jobs (NSGC, 2019), which is another possible explanation for why many respondents plan to pursue indirect patient care roles. With this in mind, and noting that nearly two-thirds of currently working genetic counselors indicated salary as one of their anticipated future transition motivations, it is more important than ever for institutions to review their compensation packages to better compete for quality genetic counselors. In this study, respondents began to indicate salary as a motivator significantly less often when salaries fell in the $85,000 - $95,000 increment. When comparing the salary motivation trends, it seems that genetic counselors reach income satiation around this amount, rather than the estimated $105,000 found by Jebb, Tay, Diener, & Oishi (2018). However, the previously reported $105,000 represents income satiation for a single person household, and survey participants were not asked to describe their relationship status or household size, making the direct comparison uninformative. This number also does not include benefits, which likely affect individuals’ view on compensation overall.
Nonetheless, this finding may provide a starting point as institutions evaluate and begin to modify their existing compensation packages.

Another factor which likely contributes to the increased interest in indirect patient care roles is the value which genetic counselors place on promotion and advancement opportunity. This study shows that the majority of GC-jobs did not have a system in place for promotion or advancement, and those that did skewed significantly to the workplaces that the authors designated as “non-traditional” (Appendix Table A3). Additionally, about two-thirds of genetic counselors do not advance to management-level in their careers, and of those, 41.8% remain entry-level, illuminating a potential lack of advancement opportunities among genetic counselors as a whole. Interestingly, more genetic counselors find themselves in Director or Manager type of positions than in mid-level management, supervisor, or direct-report type of management positions. This perhaps speaks to the fact that many are hired to establish a genetic counseling practice and are the sole genetic counselors in the department.

Additional evidence in the lack of upward mobility is illuminated in Figure 6. For each job, about half of the respondents who transitioned from that job remained entry-level while the other half advanced to a higher level. Meanwhile, it took staying 1.4 to 2.4 times longer on average at an entry-level position in order to advance in a next position than to remain at entry-level in a next position. However, these results do not account for individual respondents’ desire for advancement or lack thereof, nor do they fully address the complication that our survey limited responses to five categories, which may not accurately capture the breadth of roles or titles genetic counselors may hold. These findings may point to the absence of intermediate positions for genetic counselors, meaning there is little opportunity for growth in most institutions beyond the title of “Senior Genetic Counselor.” Moreover, the true meaning of the
title “Senior Genetic Counselor” is another aspect of this topic which is not addressed, as it is unclear if it results in more responsibility, expanded roles, or higher pay. Further research is needed to determine the significance of these promotions, especially in “traditional” settings.

Another frequently selected transition motivation was “time for something new.” The prominence of this answer choice indicates a trend in the field of genetic counseling where many individuals reach a point in a job, setting, or specialty where they are ready for a new challenge. It could indicate interests in moving to different clinical specialties or transition from a direct patient care role to an indirect patient care role. The 1.7-fold increase in percentage over time may also reflect the increased diversity of both setting and specialty in the field over time as discussed above, as well as indicate the value genetic counselors place on challenging themselves professionally and intellectually. Another interesting finding that speaks to this particular value is the fact that genetic counselors took on GC and teaching side jobs in addition to their primary employment as they moved to later positions.

Overall, the results of this study indicate there are gaps between what genetic counselors currently have in their jobs and careers and what they desire. It is clear which attributes are driving them to transition, but rather than transitioning to another typical, clinic-based, direct patient care positions, genetic counselors are increasingly pursuing non-clinic based, indirect patient care positions. A large portion of genetic counseling training is involved in facilitating direct patient care and addressing patients’ psychosocial needs, a valuable and unique skill set. Therefore, this trend of transitioning away from clinical roles, now seen earlier in a career, is particularly concerning. To combat this, institutions could begin to offer more of the job attributes most desired by genetic counselors today - opportunities for advancement, expanded roles, flexibility, and increased salaries. Institutions could implement diversified roles for genetic
counselors, where they take on a mix of clinical and non-clinical responsibilities, such as research or laboratory work, as well as utilize remote working one day a week. Institutions could implement a form of career ladder system (such as the clinical ladder program described by Kofman, Seprish, and Summar [2016]), where genetic counselors have increasing levels of responsibility and commensurate salary. Most importantly, institutions must employ creative strategies to address the high levels of burnout and compassion fatigue in direct patient care roles; for example, a streamlined process including the utilization of chatbot or educational videos, or hiring genetic counseling assistants to help with particularly laborious tasks. These are perpetual challenges, yet such changes may help counter the drain of clinicians and keep genetic counselors who are motivated by these factors in much needed direct patient care roles. On the other hand, formal training may need to adapt by having more accredited programs, accepting more students, and diversifying training tracks to combat genetic counselor shortage in general as well as to adapt to the ever-changing practice landscape of genetic counseling.

**Study Limitations**

Only alumni for which the authors had a valid email address were sent the invitation to participate in the study. When gathering alumni emails, many turned out to be inactive and as a result, about 100 emails were undeliverable. It is acknowledged that it was less likely that the alumni from earlier graduating classes had active email addresses and that many had passed away at the time of the survey. The authors chose not to reach out to secondary sources to receive career arc data for alumni who did not have valid email addresses or had passed away. It is acknowledged that these alumni are not represented in this study and limited the ability to assess career arcs of earlier graduates of the program. The authors also acknowledge a potential ascertainment bias as those alumni who left the GC field were less likely to remain connected to
the alumni base and therefore less likely to have received our survey. Therefore the analysis of the career arcs of those in a NGC field likely underestimates the number of alumni who moved into those environments.

When reviewing survey data, it became apparent to the authors that there were a few questions and topics which created confusion among participants. It was likely not made clear enough that a promotion or new title is to be regarded as a separate job, which made it difficult to analyze promotions from Genetic Counselor I to Genetic Counselor II, etc. Participants were asked to indicate the level of each position, but were not asked to specify if this was the level at the time of hire or at the time of taking the survey, further complicating the analysis regarding title or advancement trends. In addition, there were two respondents who indicated they had a longer than 30-year gap between graduating from JHMGPHG and starting their first and current job; based on their responses to the rest of the survey, the authors concluded there may have designated their first job as relating to their most recent job instead. These two individuals’ responses were disqualified and therefore not included in most analysis. A further limitation to the survey was that it did not allow participants to identify more than one primary specialty, which contributed to a high number of “other” responses and limited the ability to analyze the number of alumni and individual jobs encompassing multiple primary specialties. An extra specialty of “research” would have been beneficial to include, as many respondents indicated this in the “other” category. Without this option on the survey, it is unclear how many respondents would have indicated “research” as a primary specialty. The survey also did not distinguish between part-time and full-time positions.

For each position, participants were asked to estimate their starting salaries adjusted for inflation to what their salary would be today, but it was impossible to know if this conversion
was done accurately, uniformly, or at all, which made direct comparison of salary trends extremely challenging and made this a considerable limitation to analysis. This especially complicated the large amount of responses received indicating their salary was <$65,000, which was the lowest category provided. Additionally, the survey only captured the starting salary of respondents’ positions, so the possibility that their current salary was higher was not taken into account for the analysis of salary related transition motivation.

When analyzing the number of “traditional” and “non-traditional” jobs that had systems for promotion or advancement of genetic counselors, in order to preserve anonymity, the survey did not allow the authors to take into account the possibility that multiple respondents may have worked in the same institution as one another, therefore slightly inflating the number of jobs overall.

Finally, due to the relative youth of the profession of genetic counseling, the authors acknowledge that most respondents had not reached a natural career end, and therefore much of the full career arc analysis will continue to evolve.

**Conclusions**

The goals of this study were to illuminate the genetic counseling professional landscape by reviewing the job sequence of genetic counselors from nearly 50 graduating cohorts in the history of JHMGPHG at Sarah Lawrence College, and investigate the motivations behind their corresponding career arcs. This study identified significant preparedness, specialty, and job trends over time in the career of a genetic counselor as well as important themes in future plans and motivations. Not only are genetic counselors playing a wider variety of roles than ever before, they expect and value opportunities for professional growth, development, and advancement at a higher rate, while salary remains a powerful motivator across careers including
genetic counseling. All of these values must be addressed moving forward, as institutions adapt to attract quality genetic counselors in facing an evolving profession. Additionally, as genetic counselors advance in their careers, they rely increasingly on CE and learning on the job for preparedness. This should act as an invitation for more dynamic and accessible CE options for genetic counselors of all graduation years, but especially for those in earlier graduating cohorts. As research into career arcs of genetic counselors is still very new, given the relative brevity of the field, additional research is needed to address how career arcs are changing into the future as the professional landscape continues to evolve; research including genetic counselors from all training programs may provide a fuller picture. Additional research is also needed to fully address and explore applicable improvements to current systems for the advancement of genetic counselors, both in traditional and non-traditional work environments.

Acknowledgements

We would like to thank our thesis advisor, Claire Davis, EdD, MS, CGC and our thesis mentor, Talya Boisjoli, MS, CGC, for their guidance and advice during this project. We would also like to thank Laura Hercher, MS, CGC, for her introduction to this topic and for her help in gathering active email addresses for survey recruitment. Finally, we would like to thank the survey participants for their time.
References


Retrieved from https://digitalcommons.slc.edu/genetics_etd/45


## Appendix A

**Table A1: Intended Specialty For Future GC Position**

<table>
<thead>
<tr>
<th>Intended Specialty</th>
<th>%</th>
<th>n</th>
<th>Direct Patient Care</th>
<th>Indirect Patient Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy / Public Health</td>
<td>1.54%</td>
<td>2</td>
<td>50.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>ART/Infertility Genetics</td>
<td>2.31%</td>
<td>3</td>
<td>33.3%</td>
<td>66.6%</td>
</tr>
<tr>
<td>Cancer Genetics</td>
<td>16.92%</td>
<td>22</td>
<td>45.5%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Cardiovascular Genetics</td>
<td>4.62%</td>
<td>6</td>
<td>83.3%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Education</td>
<td>10.77%</td>
<td>14</td>
<td>21.4%</td>
<td>78.6%</td>
</tr>
<tr>
<td>Hematology Genetics</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Industry (business development)</td>
<td>14.62%</td>
<td>19</td>
<td>100%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Laboratory (report writing, variant curation, etc)</td>
<td>13.08%</td>
<td>17</td>
<td>100%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Metabolic Genetics</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Mitochondrial</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Neurogenetics</td>
<td>1.54%</td>
<td>2</td>
<td>100%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Oncology</td>
<td>0.77%</td>
<td>1</td>
<td>0.00%</td>
<td>100%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>0.77%</td>
<td>1</td>
<td>0.00%</td>
<td>100%</td>
</tr>
<tr>
<td>Pediatric / General Genetics</td>
<td>8.46%</td>
<td>11</td>
<td>100%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Pharmacogenetics</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Prenatal Genetics</td>
<td>10.00%</td>
<td>13</td>
<td>76.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>14.62%</td>
<td>19</td>
<td>31.6%</td>
<td>68.4%</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>49</td>
<td></td>
<td>81</td>
</tr>
</tbody>
</table>
Table A2: Primary Motivations For Leaving Positions

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Leaving All GC Positions Combined</th>
<th>Leaving First GC Position</th>
<th>Transition to Future Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher salary/better benefits</td>
<td>32.03% (90)</td>
<td>37.01% (47)</td>
<td>63.04% (87)</td>
</tr>
<tr>
<td>Desired more opportunity for career advancement/promotion</td>
<td>26.69% (75)</td>
<td>29.13% (37)</td>
<td>47.83% (66)</td>
</tr>
<tr>
<td>Desired more opportunity for professional growth</td>
<td>34.52% (97)</td>
<td>37.01% (47)</td>
<td>53.62% (74)</td>
</tr>
<tr>
<td>Patient load too high / workload too high</td>
<td>7.47% (21)</td>
<td>9.45% (12)</td>
<td>15.94% (22)</td>
</tr>
<tr>
<td>Difficult patient population/high no show rate</td>
<td>1.78% (5)</td>
<td>3.15% (4)</td>
<td>N/A</td>
</tr>
<tr>
<td>Desired more flexibility</td>
<td>9.96% (28)</td>
<td>7.09% (9)</td>
<td>24.64% (34)</td>
</tr>
<tr>
<td>Burnout/compassion fatigue / stress</td>
<td>11.03% (31)</td>
<td>10.24% (13)</td>
<td>34.06% (47)</td>
</tr>
<tr>
<td>Lack of administrative support</td>
<td>18.15% (51)</td>
<td>21.26% (27)</td>
<td>13.77% (19)</td>
</tr>
<tr>
<td>Desired different workplace setting</td>
<td>23.84% (67)</td>
<td>22.83% (29)</td>
<td>11.59% (16)</td>
</tr>
<tr>
<td>Did not feel adequately valued or recognized for work</td>
<td>18.86% (53)</td>
<td>19.69% (25)</td>
<td>21.74% (30)</td>
</tr>
<tr>
<td>Dissatisfactory amount of autonomy</td>
<td>6.05% (17)</td>
<td>7.09% (9)</td>
<td>N/A</td>
</tr>
<tr>
<td>Family/relationship responsibilities</td>
<td>16.01% (45)</td>
<td>10.24% (13)</td>
<td>19.57% (27)</td>
</tr>
<tr>
<td>Geographical location</td>
<td>28.11% (79)</td>
<td>33.86% (43)</td>
<td>20.29% (28)</td>
</tr>
<tr>
<td>Skills better fitted in a different position</td>
<td>4.63% (13)</td>
<td>3.94% (5)</td>
<td>3.62% (5)</td>
</tr>
<tr>
<td>Desired more direct patient care</td>
<td>3.20% (9)</td>
<td>3.15% (4)</td>
<td>N/A</td>
</tr>
<tr>
<td>Desired less direct patient care</td>
<td>4.98% (14)</td>
<td>5.51% (7)</td>
<td>N/A</td>
</tr>
<tr>
<td>Pursuing another master’s or an advanced degree</td>
<td>1.42% (4)</td>
<td>2.26% (3)</td>
<td>6.52% (9)</td>
</tr>
<tr>
<td>Time for something new</td>
<td>23.49% (66)</td>
<td>16.54% (21)</td>
<td>39.13% (54)</td>
</tr>
<tr>
<td>Promotion or transition within the same company/hospital network</td>
<td>7.83% (22)</td>
<td>6.30% (8)</td>
<td>N/A</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>26.33% (74)</td>
<td>20.47% (26)</td>
<td>5.07% (7)</td>
</tr>
<tr>
<td>More passionate/interested in new position</td>
<td>N/A</td>
<td>N/A</td>
<td>21.74% (30)</td>
</tr>
<tr>
<td>Total answered</td>
<td>281</td>
<td>127</td>
<td>138</td>
</tr>
</tbody>
</table>
Table A3: Designation Criteria of Work Roles/Settings

<table>
<thead>
<tr>
<th>Specialties</th>
<th>Work Settings</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy/public health, ART/infertility genetics, cancer genetics, cardiogenetics, hematology, laboratory (report writing, variant curation, etc), metabolic genetics, mitochondrial genetics, neurogenetics, oncology, ophthalmology, pediatric/general genetics, pharmacogenetics, prenatal genetics, or an “other” category fitting close to one of the above specialties</td>
<td>Large hospital center (&gt;500 beds), local hospital (&lt;500 beds), private physician practice, college/university, home office (telegenetics), or an “other” category fitting close to one of the above settings</td>
<td>Traditional</td>
</tr>
<tr>
<td>Education, industry (business development), or an “other” category fitting close to one of these settings</td>
<td>Laboratory office, home office (industry/research), or an “other” category fitting close to one of the above settings</td>
<td>Non-traditional</td>
</tr>
<tr>
<td></td>
<td>Laboratory office, home office (industry/research), home office (telegenetics), college/university, or an “other” category fitting close to one of the above settings</td>
<td>Non-traditional</td>
</tr>
</tbody>
</table>
Appendix B

Recruitment Notice

Dear SLC Human Genetics Alum,

You are invited to participate in a research study to gather information about the career arc of genetic counselors. This research is being conducted as part of the graduation requirements for the students of the Joan H. Marks Program in Human Genetics.

You were selected to participate in this survey because you are a graduate of Sarah Lawrence College’s Joan H. Marks Program in Human Genetics. The aim of this study is to better understand the individual and collective career arcs of graduates of the program. Our program has a long and rich history and data collected from this large pool of alumni is extremely valuable for the genetic counseling field.

Participation in this study is voluntary and takes about 10-20 minutes to complete. Information will be collected without personal identifiers and kept confidential.

Thank you for considering taking this survey. If there are any questions or concerns about the study, you are encouraged to contact us for more information:

- Janice Smires (wcheng@gm.slc.edu)
- Michael Peneycad (mpeneycad@gm.slc.edu)
- Jovanni Cuevas (jcuevas@gm.slc.edu)
- Kara Williams (kwilliams2@gm.slc.edu)

We ask that all participants complete this survey by March 2nd. Thank you so much for your time and help in completing this research.

To access the survey please follow this link:

https://www.surveymonkey.com/r/SLCGCCareer

Sincerely,
Janice Smires, Michael Peneycad, Jovanni Cuevas, and Kara Williams
Claire Davis, EdD, MS, CGC, Primary Advisor
Joan H. Marks Program in Human Genetics at Sarah Lawrence College
First Email Reminder

Dear SLC Human Genetics Alum,

Thank you for considering participating in our study regarding the career arc of genetic counselors. If you have already completed your survey, thank you for your participation. If you have not, you may access the survey using the link below at any time to do so. We ask that all participants complete this survey by March 2nd.

As a reminder, you were selected to participate in this survey because you are a graduate of Sarah Lawrence College’s Joan H. Marks Program in Human Genetics. The aim of this study is to better understand the individual and collective career arcs of graduates of the program. Our program has a long and rich history and data collected from this large pool of alumni is extremely valuable for the genetic counseling field.

If there are any questions or concerns about the study, you are encouraged to contact us for more information:

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Kara Williams (kwilliams2@gm.slc.edu)

To access the survey please follow this link:

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Sincerely,

Janice Smires, Michael Peneycad, Jovanni Cuevas, and Kara Williams
Claire Davis, EdD, MS, CGC, Primary Advisor
Joan H. Marks Program in Human Genetics at Sarah Lawrence College
Final Email Reminder

Dear SLC Human Genetics Alum,

Thank you for considering participating in our study regarding the career arc of genetic counselors. If you have already completed your survey, thank you for your participation. We would like to give interested individuals who haven’t already completed the survey one more day to participate in the study. The survey will be closed at midnight on March 3rd.

As a reminder, you were selected to participate in this survey because you are a graduate of Sarah Lawrence College’s Joan H. Marks Program in Human Genetics. The aim of this study is to better understand the individual and collective career arcs of graduates of the program. Our program has a long and rich history and data collected from this large pool of alumni is extremely valuable for the genetic counseling field.

If there are any questions or concerns about the study, you are encouraged to contact us for more information:

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- Jovanni Cuevas (jcuevas@gm.slc.edu)
- Kara Williams (kwilliams2@gm.slc.edu)

To access the survey please follow this link:

https://www.surveymonkey.com/r/SLCGCCareer

Sincerely,

Janice Smires, Michael Peneycad, Jovanni Cuevas, and Kara Williams
Claire Davis, EdD, MS, CGC, Primary Advisor
Joan H. Marks Program in Human Genetics at Sarah Lawrence College
Appendix C

Survey Consent

Thank you for participating in this project, aimed to assess the individual career arcs of alumni of the Joan H. Marks Graduate Program in Human Genetics. Our program is unique in our rich and long history, so data collected from the large pool of alumni is extremely valuable for the Genetic Counseling field. It is therefore pivotal that we capture responses from a range of graduation years in order to analyze a full career in the field, as well as compare results among different generations of graduates.

Participation is entirely voluntary and takes about 10-20 minutes in most instances. However, the time required to complete the survey depends largely on the number of post-graduation jobs an individual has held. Although the survey is made up of questions regarding your career choices, no identifiable information is gathered, nor will it be made public.

In this survey, respondents are guided through a series of questions regarding up to 10 post-graduation jobs. For each job, there are questions on the nature of the position and environment, self assessment, and the reasons for leaving. A change in title or primary clinical specialty within the same company or healthcare network is considered a separate job. If you held multiple jobs during a given period, please answer based on the primary position. Concurrent secondary jobs are addressed in one supplemental question.

We look forward to your responses and sharing our findings in the near future. By clicking “Next” below, you indicate that you understand the information on this form, and you voluntarily agree to participate in this study.
Appendix D

Survey Questions

Demographics

1. What is your gender identity?
   - Female
   - Male
   - Other

2. Growing up, you would consider your household income to be:
   - Upper class
   - Upper Middle class
   - Lower Middle class
   - Lower class

3. What is your highest level of education?
   - Master’s degree
   - Doctoral degree

4. What was your highest level of education prior to entering a genetic counseling master’s program?
   - Bachelor’s degree
   - Master’s degree
   - Doctoral degree

5. This degree is in a field:
   - Related to genetic counseling
   - Unrelated to genetic counseling

6. What age were you when you entered a genetic counseling master’s program?

7. What were your primary motivations for entering the field of genetics/genetic counseling?
   (Select all that apply)
   - Passion/Interest in subject/setting
   - Work life balance
   - Good fit for skillset (communicating, educating, listening, supporting, etc.)
   - Desire for professional growth, advancement, autonomy, recognition
   - Salary/benefits (health care, vacation time, covering membership dues, etc)
   - Other (please specify)

8. In which year did you graduate from Sarah Lawrence College?

9. Did you work prior to entering a genetic counseling master’s program?
-Yes
-No

Work Experiences Prior to Genetic Counseling

10. How many years did you work after obtaining a bachelor’s degree but prior to entering a genetic counseling master’s program? (round to the nearest whole number)

11. Did you work in a healthcare/science/laboratory industry? 
   -Yes 
   -No

12. Would you consider at least one of the positions you held to be patient facing? 
   -Yes 
   -No

13. Which of the following levels do you consider the last position you held prior to entering a genetic counseling program? 
   -Entry-level contributor 
   -Senior-level contributor 
   -Mid-level management (e.g. Supervisor or Direct Report) 
   -Director-level management (e.g. Manager/Director) 
   -Executive-level management (e.g. C-Suite)

Job After Genetic Counseling Program (Set of questions completed for each job up to 10 jobs) 

14. Was/Is your first job after graduation in the field of genetics/genetic counseling? 
   -Yes 
   -No

After GC Program: GC Related (Set of questions completed for each job up to 10 jobs, if “YES” to Q14) 

15. Is this your current job? 
   -Yes 
   -No

16. What was/is the primary specialty you work(ed) in? 
   -Advocacy / Public Health 
   -ART/Infertility Genetics 
   -Cancer Genetics 
   -Cardiovascular Genetics 
   -Education 
   -Hematology Genetics 
   -Industry (business development) 
   -Laboratory (report writing, variant curation, etc) 
   -Metabolic Genetics 
   -Mitochondrial
-Neurogenetics
- Oncology
- Ophthalmology
- Pediatric / General Genetics
- Pharmocogenetics
- Prenatal Genetics
- Other (please specify)

17. What was/is your primary work setting:
- Large hospital center (>500 beds)
- Local hospital (<500 beds)
- Private physician practice
- College/University
- Laboratory office
- Home office (telegenetics)
- Home office (industry/research)
- Other (please specify)

18. Age when starting in this position:

19. Years in this position:

20. Do you consider this position:
- Entry-level contributor (e.g. Genetic Counselor)
- Senior-level contributor (e.g. Senior Genetic Counselor)
- Mid-level management (e.g. Supervisor or Direct Report)
- Director-level management (e.g. Manager/Director)
- Executive-level management (e.g. C-Suite)

21. Do you consider this position:
- Clinical
- Nonclinical

22. In this position, which did/do you spend a majority of your time involved in?
- Direct Patient Care
- Indirect Patient Care
- Not involved in patient care

23. Was/is there a system in place for promotions or advancement for genetic counselors at this position?
- Yes
- No

24. Starting salary (best estimate adjusted to today’s equivalent):
$<65,000
-$65,000 - $75,000
-$75,001 - $85,000
-$85,001 - $95,000
-$95,001 - $105,000
-$105,001 - $115,000
-$115,001 - $125,000
-$125,001 - $135,000
-$135,001 - $145,000
->$145,000

25. My overall life/work experiences prior to genetic counseling school prepared me for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree

26. Genetic counseling graduate school prepared me for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree

27. I needed to learn significantly on the job for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree

28. Continuing education opportunities prepared me for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree
- Not applicable

29. A degree program beyond my Human Genetics M.S. prepared me for this position.
- strongly agree
- agree
-neutral  
-disagree  
-strongly disagree  
-Not applicable

30. Did/Do you hold a secondary or side job while you worked/work in this position?  
-No  
-Yes (please specify)

Job GC Continued  (Set of questions completed for each job up to 10 jobs)  
31. After this position, you...  
-Transitioned to another job  
-Had a gap for longer than 1 year before returning to the workforce  
-Left the workforce

GC Related Transition Motivations (Set of questions completed for each job up to 10 jobs)  
32. What were your primary motivations for leaving this position? (select all that apply)  
-Higher salary/better benefits (health care, vacation time, covering membership dues, etc)  
-Desired more opportunity for career advancement/promotion  
-Desired more opportunity for professional growth (continued learning, expanded roles, etc)  
-Patient load too high  
-Difficult patient population/high no show rate  
-Desired more flexibility  
-Burnout/compassion fatigue  
-Lack of administrative support  
-Desired different workplace setting  
-Did not feel adequately valued or recognized for work  
-Dissatisfactory amount of autonomy  
-Family/relationship responsibilities  
-Geographical location  
-Skills better fitted in a different position  
-Desired more direct patient care  
-Desired less direct patient care  
-Pursuing another master’s or an advanced degree  
-Time for something new  
-Promotion or transition within the same company/hospital network  
-Other (please specify)

GC Transition Salary (Set of questions completed for each job up to 10 jobs, if salary/benefits option was selected in Q32)  
33. Was salary/benefits your number 1 reason for leaving?  
-Yes  
-No
34. If salary/benefits had become satisfactory in this specific position, would you have stayed in this position longer?
- Yes
- No

After GC Program: Non-GC Related (Set of questions completed for each non-GC job up to 10 jobs, if “NO” to Q14)
35. Is this your current job?
- Yes
- No

36. In what field did/do you work in this job?
- Patient-facing Healthcare
- Non-patient-facing Healthcare
- Applied science/laboratory
- Education
- Social Services
- Sales/Marketing
- Hospitality/Tourism/Service Industry
- Architecture/Civil Engineering
- Management/Business
- Finance
- Government/Public Administration
- Entertainment/Events
- Trades/Transportation
- Computer Science/Technology
- Communications
- Arts
- Law
- Public Safety/Corrections
- Engineering
- Mathematics
- Manufacturing
- Agriculture
- Other (please specify)

37. Age when starting in this position:

38. Years in this position:

39. Do you consider this position:
- Entry-level contributor
- Senior-level contributor
- Mid-level management (e.g. Supervisor or Direct Report)
-Director-level management (e.g. Manager/Director)
-Executive-level management (e.g. C-Suite)

40. Starting salary (best estimate adjusted to today’s equivalent):
-< $65,000
-$65,000 - $75,000
-$75,001 - $85,000
-$85,001 - $95,000
-$95,001 - $105,000
-$105,001 - $115,000
-$115,001 - $125,000
-$125,001 - $135,000
-$135,001 - $145,000
-> $145,000

41. My overall life/work experiences prior to genetic counseling school prepared me for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree

42. Genetic counseling graduate school prepared me for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree

43. I needed to learn significantly on the job for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree

44. Continuing education opportunities prepared me for this position.
- strongly agree
- agree
- neutral
- disagree
- strongly disagree
- Not applicable
45. A degree program beyond my Human Genetics M.S. prepared me for this position.
   -strongly agree
   -agree
   -neutral
   -disagree
   -strongly disagree
   -Not applicable

46. Did/do you hold a secondary or side job while you worked/work in this position?
   -No
   -Yes (please specify)

Non-GC Continued (Set of questions completed for each non-GC job up to 10 jobs)
47. After this position, you...
   -Transitioned to another job
   -Had a gap for longer than 1 year before returning to the workforce
   -Left the workforce

Non-GC Transition Motivations (Set of questions completed for each non-GC job up to 10 jobs)
48. What were your primary motivations for leaving this position? (select all that apply)
   -Higher salary/better benefits (health care, vacation time, covering membership dues, etc)
   -Desired more opportunity for career advancement/promotion
   -Desired more opportunity for professional growth (continued learning, expanded roles, etc)
   -Workload too high
   -Desired more flexibility
   -Burnout/Stress
   -Lack of administrative support
   -Dissatisfactory workplace setting
   -Did not feel adequately valued or recognized for work
   -Family/relationship responsibilities
   -Geographical location
   -Skills better fitted in a different position
   -More passionate/interested in new position
   -Pursuing another master’s or an advanced degree
   -Time for something new
   -Promotion or transition within the same company
   -Other (please specify)

Non-GC Transition: Salary (Set of questions completed for each non-GC job up to 10 jobs, if salary/benefits option was selected in Q48)
49. Was salary/benefits your number 1 reason for leaving?
   -Yes
   -No
50. If salary/benefits had become satisfactory in this specific position, would you have stayed in this position longer?
-Yes
-No

Future Transitions (if “YES” to Q15 or Q35)
384. If you plan to transition to a new position in the future, it ideally will be:
-Direct patient care
-Indirect patient care
-Non-genetics/genetic counseling related
-I plan to retire after this position.

Future Transitions-GC Related Positions (if “direct patient care” or “indirect patient care” option was selected in Q384)
385. It will ideally be in the specialty of:
-Advocacy / Public Health
-ART/Infertility Genetics
-Cancer Genetics
/Cardiovascular Genetics
-Education
-Hematology Genetics
-Industry (business development)
-Laboratory (report writing, variant curation, etc)
-Metabolic Genetics
-Mitochondrial
-Neurogenetics
-Oncology
-Ophthalmology
-Pediatric / General Genetics
-Pharmacogenetics
-Prenatal Genetics
-Other (please specify)

386. If you intend to transition to a new position from your current one in the future, what do you anticipate your primary motivations will be? (select all that apply)
-Higher salary/better benefits (health care, vacation time, covering membership dues, etc)
-Desire for more opportunity for career advancement/promotion
-Desire for more opportunity for professional growth (continued learning, expanded roles, etc)
-Workload too high
-Desire more flexibility
-Burnout/Stress
-Lack of administrative support
-Dissatisfactory workplace setting
- Do not feel adequately valued or recognized for work
- Family/relationship responsibilities
- Geographical location
- Skills better fitted in a different position
- More passionate/interested in new position
- Pursuing another master’s or advanced degree
- Time for something new
- Other (please specify)

Future Transition - Non-GC Positions (if “non-genetics/genetic counseling related” option was selected in Q384)

387. It will ideally be in the field of:
- Patient-facing Healthcare
- Non-patient-facing Healthcare
- Applied science/laboratory
- Education
- Social Services
- Sales/Marketing
- Hospitality/Tourism/Service Industry
- Architecture/Civil Engineering
- Management/Business
- Finance
- Government/Public Administration
- Entertainment/Events
- Trades/Transportation
- Computer Science/Technology
- Communications
- Arts
- Law
- Public Safety/Corrections
- Engineering
- Mathematics
- Manufacturing
- Agriculture
- Other (please specify)

388. If you intend to transition to a new position from your current one in the future, what do you anticipate your primary motivations will be? (select all that apply)
- Higher salary/better benefits (health care, vacation time, covering membership dues, etc)
- Desire for more opportunity for career advancement/promotion
- Desire for more opportunity for professional growth (continued learning, expanded roles, etc)
- Workload too high
- Desire more flexibility
- Burnout/Stress
- Lack of administrative support
- Dissatisfactory workplace setting
- Do not feel adequately valued or recognized for work
- Family/relationship responsibilities
- Geographical location
- Skills better fitted in a different position
- More passionate/interested in new position
- Pursuing another master’s or advanced degree
- Time for something new
- Other (please specify)

Future Transition—Retirement (if “I plan to retire after this position” option was selected in Q384)

389. If you plan to retire after this position, what do you anticipate will be your primary reasons for exiting the workforce? (select all that apply)
- Burnout/stress
- Desire to travel
- More time for hobbies
- More time with friends/family
- Sufficient household income
- Personal health
- Caring for loved one
- Logical end of my career
- Other (please specify)

Left the Workforce (if “left the workforce” option was selected in Q31 or Q47)

390. At what age did you exit the workforce?

391. What were your primary reasons for exiting the workforce? (select all that apply)
- Burnout/stress
- Desire to travel
- More time for hobbies
- More time with friends/family
- Sufficient household income/savings
- Personal health
- Caring for loved one
- Logical end of my career
- Other (please specify)

392. Do you plan to return to the workforce?
- Yes
- No

Return to the Workforce (if “YES” in Q392)

393. Which category would be ideal for your next position?
- Direct patient care
- Indirect patient care
- Non-genetics/genetic counseling related - please skip the next question

394. It will ideally be in the specialty of:
- Advocacy / Public Health
- ART/Infertility Genetics
- Cancer Genetics
- Cardiovascular Genetics
- Education
- Hematology Genetics
- Industry (business development)
- Laboratory (report writing, variant curation, etc)
- Metabolic Genetics
- Mitochondrial
- Neurogenetics
- Ophthalmology
- Pediatric / General Genetics
- Pharmocogenetics
- Prenatal Genetics