

Cancer Registrar Workload and Staffing Study: Guidelines for Hospital Cancer Registry Programs

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Executive Summary

Cancer registrars are vital to cancer surveillance. Foundational cancer registrar work includes collecting, coding, reporting, and curating national cancer data. However, cancer registry work extends far beyond these processes. Cancer registrars are often considered a nonrevenue-producing role within hospitals, and registry managers have reported struggling to justify adequate staffing needs. To inform staffing decisions, managers use cancer registry research and staffing guidelines. This study aims to update staffing guidelines by documenting and quantifying the required tasks of hospital-based cancer registrars and to collect qualitative data about the roles and skills required for future registrar functions.

For this study, two surveys were conducted: the Registry Lead Survey (RLS) and the Cancer Registrar Survey (CRS). Survey development was informed by cancer data and registry experts, and both surveys were pretested. The RLS was sent to all self-identified cancer registry managers/leads working at hospital-based registries in the membership database of the National Cancer Registrars Association (NCRA). Registry leads were asked to send the CRS to their cancer registrar staff. In addition, postsurvey interviews were conducted with 11 experts and leaders in the cancer registry industry to understand future implications for the profession based on the survey findings. This 2024 workload study examines data from the years 2019 to 2022.

The RLS received 237 responses, where 94 registry leads served multiple institutions, 141 leads served single institutions, and 2 leads did not specify their registry type. The RLS included these key findings:

- Just over half of the registries had productivity standards for all positions, 24.9% had standards for some positions, and 23.6% did not have standards for any positions.
- Registry leads estimated taking, on average, about 1 hour to complete an abstract for a simpler case and about 1 hour and 45 minutes to complete an abstract for a more complicated case.
- The mean number of cases per FTE was 441, and the mean number of new cases accessioned was 3,132 in 2022.
- Registry leads were somewhat or very concerned with recruiting well-trained staff (87.6%), compensating staff well enough to retain them (82.3%), and funding additional positions (77.0%).
- About a quarter of the registry leads reported registry vacancies, and interviewees expressed concern about filling positions.
- Registry leads reported that nearly half (49.1%) of their staff needed additional training in data analysis, followed by case finding software (26.5%), abstracting software (24.4%), and follow-up (23.3%).
- The analytic model, which was developed for this study using data from the RLS, indicated that caseload was the dominant consideration to determine staffing needs. A secondary consideration was whether registries served one or multiple institutions.
 - For single-institution registries, for every 1,000 cases, staffing should increase by 1.8 to 2.1 FTEs, on average.
 - For multi-institution registries, for every 1,000 cases, staffing should increase by 1.6 to 1.9 FTEs, on average.

The CRS received 290 responses resulting in the following key findings:

- About 94.0% of registrars reported being satisfied with the profession.
- Registrars reported having a wide range of years of experience, from being in their early career to having over 20 years in the profession.
- Of the study respondents working at the time of the survey, 17.8% percent planned to retire or leave the profession in the next 5 years. Another 13.8% said they were not sure they would stay in the profession.
- Registrars estimated taking about 1 hour and 15 minutes to complete an abstract for a simpler case and about 2 hours and 30 minutes to complete an abstract for a more complex case.

Interviews conducted with researchers, national cancer data standard setters, experienced cancer registrars, cancer registry software developers, and cancer registry contracting representatives revealed several themes:

- Myriad artificial intelligence (AI) software innovations will change the nature of cancer registrar work by automating certain tasks, but these technologies will not eliminate the registrar's role.
 - Registrar responsibilities may move toward an increased role in ensuring data quality, managing processes for real-time data collection and reporting, and understanding how to analyze and present cancer registry data.
- The increasing complexity of cancer creates additional data collection burdens and may require further education for registrars.
- Registrars may specialize in certain areas, such as quality assurance and data analytics, as new career pathways develop.

This study led to the following conclusions:

- The workload of cancer registrars will continue to be affected by clinical advancements, requiring the collection of more complex data items.
- Technological advancements in data collection and management will shift the responsibilities of cancer registrars, but they will not eliminate the role.
- Training in advanced data skills is important for the future cancer registry workforce.
- Attracting new people to the field is critical to address existing shortages and impending workforce retirements.

Findings from this study implicate the following policies and practices:

- Registries can use workload studies to guide operational procedures, inform staffing guidelines, and create productivity standards.
 - National organizations and standard setters can create and update current policies and procedures to support hospital-based registries as these facilities seek to implement data-supported workload and staffing guidelines to ensure accurate and timely data collection and reporting.
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Acknowledgments

NCRA thanks the many volunteers who supported this effort. The Advisory Committee and interviewees spent volunteer hours to ensure the quality and usefulness of this study. The Advisory Committee members are listed in Appendix A; the interviewees are listed in Appendix B.

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Research Report

Background

Cancer registrars are vital to cancer surveillance. The foundational work of cancer registrars includes collecting, coding, reporting, and curating national cancer data. However, cancer registry work goes far beyond these processes. [Cancer registrars](#) work closely with health care professionals, hospital administrators, researchers, and cancer programs to ensure data compliance with reporting standards and serve as valuable resources for cancer information.

In a [2006 study](#) of the cancer registry workforce funded by the National Cancer Registrars Association (NCRA) and conducted by the University of California San Francisco (UCSF), cancer registrars and managers reported a need for workload and staffing standards to assess staffing requirements and to advocate for these requirements within employer organizations.

Based on that finding, NCRA, the Commission on Cancer (CoC) of the American College of Surgeons (ACS), the American Joint Committee on Cancer (AJCC), and the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC) funded the Workload and Time Management Project in the early 2010s. These funding organizations supported the recommendation that research-based workload and staffing guidelines for hospital cancer registries and central cancer registries were critical to the advancement of cancer data collection and the cancer registrar profession. The project culminated in the publication of [workload and staffing guidelines for hospital registries](#) and [workload and time management guidelines for central cancer registries](#).

Findings from two of the studies under the umbrella of the Workload and Time Management Project included a summary of the workload for cancer registrars and identified factors associated with workload, such as caseload, number of data elements collected, time needed for follow-up, and number of sources accessed for case completion. Few registries reported having any workload standards at the time of the project.

Table 1 summarizes the workload and workforce reports conducted by UCSF and published by NCRA.

Table 1. UCSF-NCRA Workload and Workforce Reports

Publication Date	Publication Title	Data Collection Year(s)
June 2006	Frontline Workers in Cancer Data Management: Workforce Analysis Study of the Cancer Registry Field	2004–05
January 2011	Summary: NCRA Workload and Staffing Study: Guidelines for Hospital Cancer Registry Programs	2007
May 2013	Summary: NCRA/NPCR Workload and Time Management Study: Guidelines for Central Cancer Registry Programs	2011
January 2023	Salary Considerations for Cancer Registrars	2022
October 2024	Cancer Registrar Workload and Staffing Study: Guidelines for Hospital Cancer Registry Programs (this report)	2019–22

Peer-reviewed literature on the workload of cancer registrars is lacking. The main studies are found in the NCRA *Journal of Registry Management* (JRM). In a [2018 study](#), a research team collected detailed data on the costs of central registry operations, including aggregate labor costs. Analysis of these data indicated areas where more resources might be needed, including personnel. The only other previous [workload study conducted by the UCSF research team](#) was published in JRM in 2012.

Need for Updated Workload and Staffing Guidelines

Anecdotal information and discussions with cancer registry leaders indicate that the 2010 staffing guidelines have been applied as a tool to inform staffing and advocate for needed staffing in cancer registries. Much has changed in registry functions over the past 14 years, however. The degree of automation in case finding and abstracting has increased, but so has the number of data items collected. There are new software products as well as more cancer data available in electronic health records (EHRs). For these reasons, it seemed timely to repeat this study to update workload and staffing guidelines. Another goal of this study was to conduct an in-depth look at future workforce needs in skills, training, roles, and career development.

Interviews with Key Leaders to Inform Proposal

The UCSF research team interviewed key leaders from national cancer organizations to inform the development of the study. Those organizations included the Surveillance, Epidemiology, and End Results Program (SEER) of the National Cancer Institute (NCI), the North American Association of Central Cancer Registries (NAACCR), the CDC-NPCR, and the CoC. Several key themes emerged from the interviews that informed the study proposal:

- New skills and roles for cancer registrars include implementing novel ways to manage knowledge gleaned from data, working with ever-changing EHRs, and increasing the focus on data quality.
- Additional skills training is needed in managing data and understanding and applying informatics, such as natural language processing (NLP).
- Cancer registrar work will shift to concentrate more on data verification and quality control.

- More emphasis is needed on concurrent abstracting and real-time data.
- Ongoing training is needed on new software programs and software updates.
- Registrars can be proactive on how to use and report on data in cancer committees.

Study Purpose

The purpose of this workload study is to update workload and staffing data for use by hospital registry managers and directors, CoC-accredited program leaders, hospital administrators, and industry leaders to make decisions on workload issues such as staffing needs and resources as well as to explore the future needs and skills of the cancer registry workforce.

Methods

This study had multiple components and was approved by the UCSF Institutional Review Board (IRB). First, the research team worked with NCRA leadership to form an Advisory Committee (see Appendix A). The research team then performed the following activities:

- Conducted presurvey interviews with cancer registry leaders and cancer registry experts (see Appendix B).
- Conducted two surveys, one for registry managers/leads and one for cancer registrars.
- Conducted postsurvey interviews with researchers, national cancer data standard setters, experienced cancer registrars, cancer registry software developers, and cancer registry contracting representatives (see Appendix B).

Presurvey Interviews

The presurvey interviews were conducted with cancer data experts and cancer registry experts at the national level to inform the development of survey items. NCRA leadership recommended the interviewees and the members of the study's Advisory Committee. A total of eight interviews were conducted with nine experts, three of whom were cancer registrars. All interviews took place over Zoom with two members of the UCSF research team and were recorded; one team member facilitated the interview while the other took notes. Interviews were conducted from June to July 2022.

Surveys

Two surveys were conducted in 2023: the Registry Lead Survey (RLS) and the Cancer Registrar Survey (CRS). The target population for the RLS was NCRA members working at a hospital registry who self-identified as registry managers/leads. The target population for the CRS was cancer registrars in NCRA's membership database who were working at a hospital registry. Because registrars could have more than one employer, respondents were asked to complete the survey for the employer who had sent them the survey link, even if not their primary employer.

Survey Development

To develop the surveys for this workload study, the UCSF research team first reviewed the surveys used in the 2011 study. The UCSF team applied its content knowledge and general survey design expertise to build upon and update the surveys for present-day implementation, including developing them for online dissemination and completion via the survey platform Qualtrics. Information provided to UCSF from the presurvey interviews with

cancer registry experts also informed the development of survey items. Once a first draft of each survey had been created, the UCSF team consulted with the NCRA team, which provided feedback. After this round of edits, both surveys were presented to the Advisory Committee for feedback. First, individual Advisory Committee members provided written input via an online form. This input was then discussed in a group forum (including the Advisory Committee members and the UCSF and NCRA teams) during two meetings conducted via Zoom.

After the surveys were edited according to presurvey interviews with national cancer registry leaders and experts and the Advisory Committee, the surveys then went through multiple rounds of pretesting with cancer registrars. The purpose of pretesting was to gather feedback about the clarity and wording of questions, the flow of questions, and potential technical issues with the online survey platform (Qualtrics). Advisory Committee members provided names of suggested pretesters and connected the UCSF team to survey pretesters. Five registry leaders pretested the RLS, and four registrars pretested the CRS. After all pretesting feedback was reviewed and changes were incorporated into the surveys, the UCSF team considered the surveys final and ready for deployment. The RLS was open from March to May 2023, and the CRS was open from March to July 2023.

Survey Content

The RLS (Appendix C) consisted of six sections in the following areas:

- Registry Characteristics
- Staffing and Administration
- Caseload Size and Composition
- Registry Procedures
- Data Management and Automation
- Respondent Opinions and Concerns

The CRS (Appendix D) consisted of five sections in the following areas:

- Job Information and Activity Log (daily activity tracker for one week)
- Job Experience
- Time Estimates – Daily, Weekly, Monthly, Annually
- COVID-19 Supplement
- Stress and Burnout Supplement

Sample Selection Process

The UCSF team used the NCRA database to identify self-designated lead registrars, who received the RLS; the lead registrars were instructed to forward the CRS to their registry staff. Those lead registrars who also performed registry duties received both surveys. RLSs and CRSs completed by leads and registrars who worked at the same registry were matched and linked to each other with a UCSF-generated identification (ID) number. This ID number was provided to each registry lead along with both the information needed to complete the RLS and the information that registrars needed to complete the CRS. Registry leads were also asked to report to the UCSF team the number of staff to whom they were going to forward the CRS. The RLS was sent to approximately 1,000 lead registrars representing about 800 registries. Participation in both surveys was voluntary.

Several challenges were encountered with sampling and data collection. Key concerns were a low response rate and reliance on a membership database to identify sample participants. Despite these issues, over 230 responses to the RLS were received for an estimated registry population of 1,800. These registries represented all ten Health and Human Services regions, small and large registries, and about 100 of both single-institution

(94) and multi-institution (141) registries. Descriptive and inferential data were stratified by registry type (single institution vs. multi-institution). Please refer to Appendix E for additional details.

Postsurvey Interviews

After the surveys were conducted and preliminary findings from the surveys were compiled, an additional set of interviews were conducted with researchers, national cancer data standard setters, experienced cancer registrars, cancer registry software developers, and cancer registry contracting representatives. The purpose of these interviews was to explore perspectives on what the survey findings meant for the future of cancer registry work, workforce development, skills training, and maintenance of skills. A total of 11 interviews were conducted: five with national partners, two with contract work experts, two with software experts, and two with experienced cancer registrars. Five of the 11 interviewees were cancer registrars at the time of the interview or had been a registrar in the past. All interviews took place over Zoom and were recorded and transcribed. The questions asked during the interviews varied depending on interview type (e.g., contract work expert, software vendor expert), but most interviewees were asked several questions about the preliminary findings from the RLS and CRS. Interviews were conducted from October 2023 to January 2024. See Appendix B for the list of interviewees and Appendix F for the interview guides.

Findings

Survey Data

This section presents findings in the following areas:

- Registry Lead Survey (RLS) Data
- Cancer Registrar Survey (CRS) Data
- Staffing Analysis and Recommendations
- Survey Data Summary
- Comparison to the [2011 NCRA Workload and Staffing Study Summary Report](#)

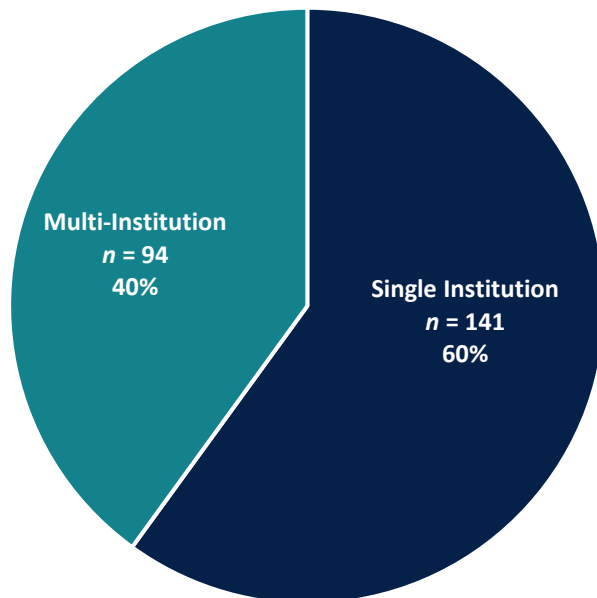
Registry Lead Survey Data

This section summarizes registry leads' responses to the Registry Lead Survey (RLS). The summary includes 237 survey responses. Most questions received approximately 200 to 230 responses. The tables and figures that follow denote the number of respondents for the question, as designated by the letter *n* or the term *observations*.

Registry Type

The 235 respondents represented 141 single-institution registries (60.0%) and 94 multi-institution registries (40.0%), as shown in Figure 1.

Figure 1. Registry Type



Health and Human Services Regions

All 10 Health and Human Services (HHS) regions were represented (Figure 2), with 22.0% ($n = 52$) of the 236 respondents representing region 4 and 18.2% ($n = 43$) representing region 5. The regions are made up of states and territories as shown in Table 2.

Figure 2. Representation of Health and Human Services Regions

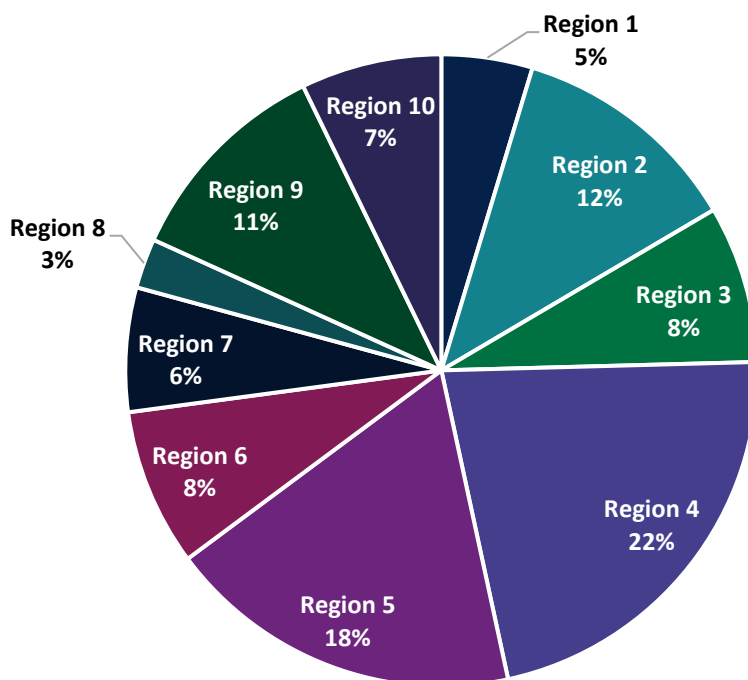


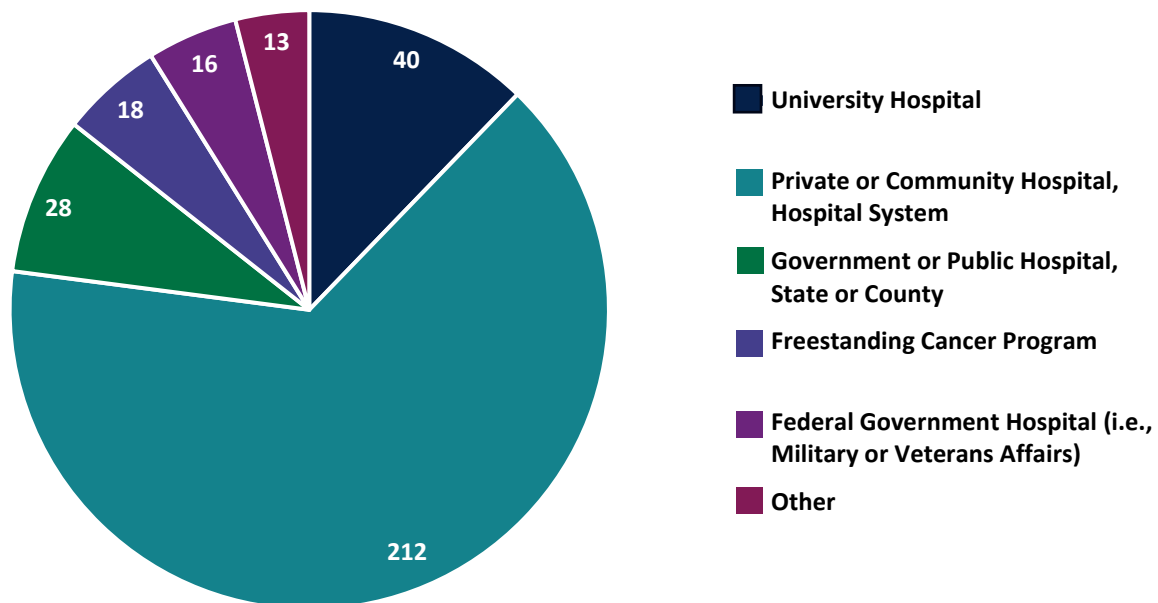
Table 2. Health and Human Services Regions

Region	<i>n</i>	%	States and Territories in HHS Region
1	11	4.7	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
2	28	11.9	New Jersey, New York, Puerto Rico, US Virgin Islands
3	19	8.1	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia
4	52	22.0	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
5	43	18.2	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
6	19	8.1	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
7	15	6.4	Iowa, Kansas, Missouri, Nebraska
8	6	2.5	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
9*	26	11.0	Arizona, California, Hawaii, Nevada
10	17	7.2	Alaska, Idaho, Oregon, Washington
All	236	100	N/A

*Region 9 also includes American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Republic of Palau, and Republic of the Marshall Islands.

Facility Type

Most respondents ($n = 212$) worked in a registry that served a private hospital, community hospital, or hospital system. Forty respondents indicated their registry served a university hospital, and 28 indicated their registry served a government hospital or a state or county public hospital. Because respondents were able to choose more than one option, counts for each facility type are provided instead of percentages.

Figure 3. Facility Type

Licensed Beds

The median number of beds for the responding facilities was 450. For registries serving single institutions, the median number of beds was 350, and for those serving multi-institutions, the median number of beds was 614. The median is used here instead of the mean because several responses with very high values would have skewed the mean to be artificially high.

Cancer Program Accreditation

Of 234 respondents, 196 (83.8%) declared that their registries were accredited as part of one or more of the programs listed in Table 3. The table displays registry counts as opposed to percentages because respondents were able to select more than one accreditation program. The total for CoC programs is greater than the number of respondents because respondents may have selected more than one CoC program. Additionally, respondents were given an option to choose “other” and type in their response. There were six of these responses, and they are not represented in Table 3.

Table 3. American College of Surgeons Accreditation Programs

Program Type/Name	Observations
CoC program*	273
National Accreditation Program for Breast Centers (NAPBC)	90
National Accreditation Program for Rectal Cancer (NAPRC)	29
None of the above	32

*CoC programs include the Comprehensive Community Cancer Program (CCCP), Community Cancer Program (CCP), Integrated Network Cancer Program (INCP), Academic Comprehensive Cancer Program (ACAD), NCI-Designated Comprehensive Cancer Center Program (NCIP), Hospital Associate Cancer Program (HACP), Veterans Affairs Cancer Program (VACP), Free Standing Cancer Center Program (FCCP), NCI-Designated Network Cancer Program (NCIN), and Pediatric Cancer Program (PCP).

Current Productivity Standards

Most respondents reported having productivity standards for some (24.8%) or all (51.3%) positions. Some 23.9% of respondents reported having no productivity standards in place (see Figure 4).

Figure 4. Productivity Standards for Registries

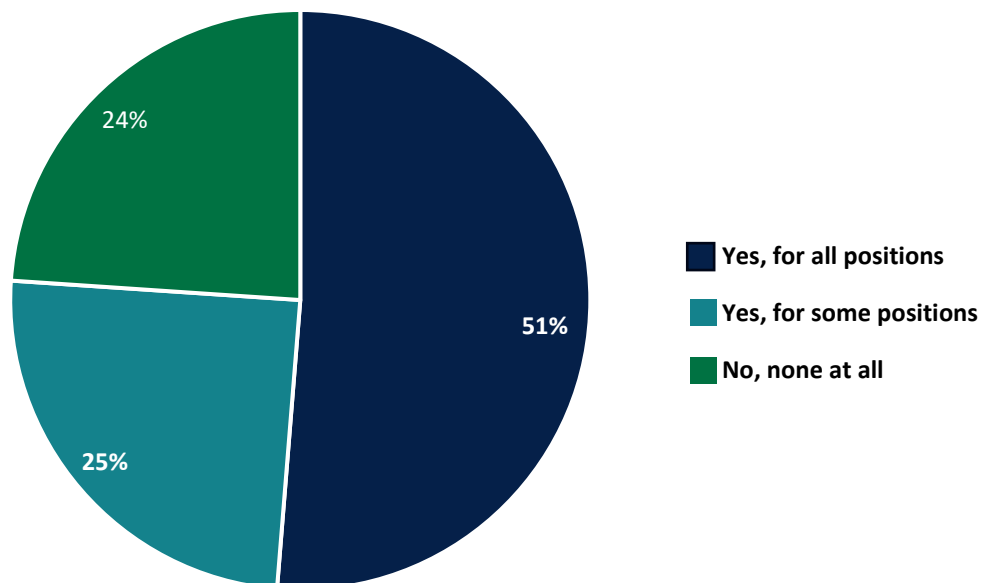


Table 4 shows the number and percent of registries with productivity standards by registry type and for all registries. Registries serving multi-institutions were more likely to have productivity standards than those serving single institutions. Only 12.9% of registries serving multi-institutions had no productivity standards in place, compared to 30.7% for single-institution registries.

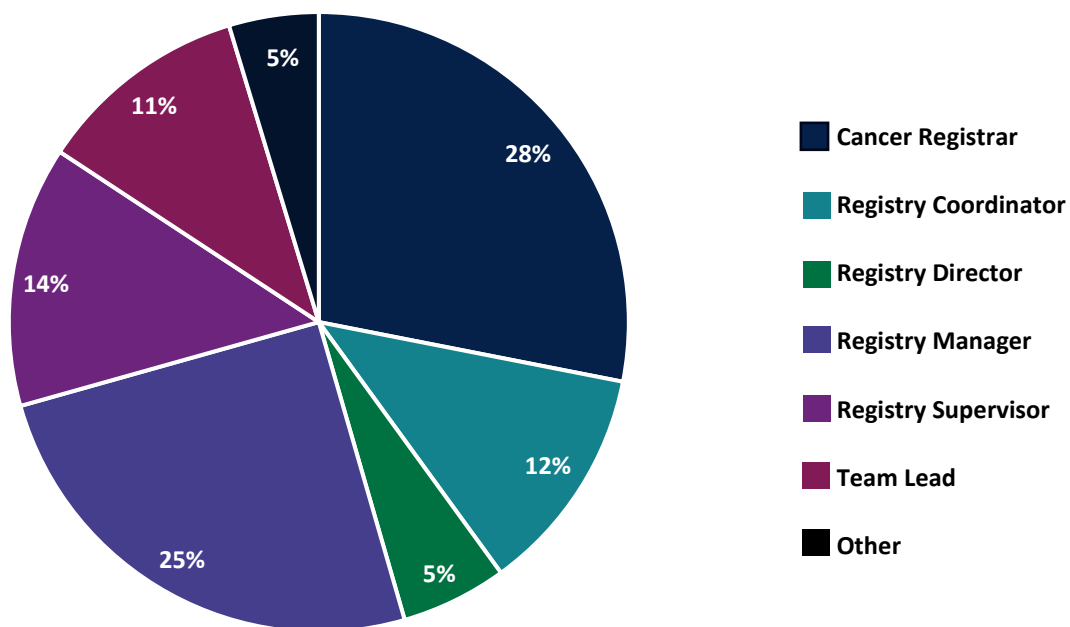
Table 4. Productivity Standards by Registry Type

Response	Multi-Institutions		Single Institutions		All	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Yes, for all positions	57	61.3	63	45.0	120	51.3
Yes, for some positions	24	25.8	34	24.3	58	24.8
No, none at all	12	12.9	43	30.7	56	23.9
Total	93	100	140	100	234	100.0

Job Title

A total of 235 respondents answered the survey question about their job title. The two most common job titles reported were cancer registrar (28.1%) and registry manager (25.1%). Only 5.5% of the respondents reported the title of registry director. An additional 4.7% of the respondents had a job title other than those offered as selections.

Figure 5. Job Title



Registry Staffing

Respondents completed questions about their registries’ current and past staffing full-time equivalent (FTE) levels. Table 5 shows the mean number of FTE positions budgeted from fiscal years 2019 to 2022. Over these years, there was a 22% increase in the mean number of budgeted FTEs reported, from 5.6 in 2019 to 6.8 in 2022. Although the number of budgeted FTEs increased, the percentage of filled FTE positions declined slightly from 96.4% in 2019 to 94.1% in 2022.

Table 5. Registry Staffing, Fiscal Years 2019–2022

	2019 N = 199	2020 N = 199	2021 N = 202	2022 N = 210
Budgeted FTE positions, mean	5.6	5.8	6.1	6.8
Filled FTE positions, mean	5.4	5.5	5.7	6.4
Filled FTE positions, %	96.4	94.8	93.4	94.1

Contract Staff Employment

As seen in Table 6, many of the respondents (32.5%) reported employing contract staff for their registries. Multi-institution registries were more likely to employ contract staff than single-institution registries (38.0% vs. 28.8%, respectively).

Table 6. Contract Staff Employment

Employed Contract Staff	Multi-Institution		Single Institution		All	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No	57	62.0	99	71.2	156	67.5
Yes	35	38.0	40	28.8	75	32.5
Total	92	100.0	139	100.0	231	100.0

Respondents reported paying contract staff by the hour (57.5%), by the case (16.4%), or using a combination of both methods (21.9%). The remaining registries (4.1%) reported using a different method.

When asked whether registry managers felt their contract staff produced high-quality abstracts, about 60.8% said “mostly yes.” The remaining responded either “sometimes” (25.7%), “not usually” (6.8%), or “other” (6.8%).

Case Types and Required Reporting to Central Registries

Respondents were asked to report the number and type of accessioned cases for their most recent completed year. For analytic cases (Class 00-22), the median number of accessioned cases reported was 1,391.5. For nonanalytic cases (Class 30+), the median number of reported cases was 202. The range for analytic cases reported was 30 to 22,000 ($n = 210$); for nonanalytic cases, the range was 1 to 14,278 ($n = 193$).

Table 7 presents data about the types of cases that are reported to central cancer registries. Of the 226 respondents, most registries ($n = 165$) reported that Class 30+ cases are required to be reported to their central or state registry. Many registries ($n = 115$) said they are required to report reportable by agreement cases, a small number ($n = 41$) said they are required to report specific case requests, and very few ($n = 19$) were not required to report nonanalytic cases. Because respondents could choose more than one category, the percentages do not add to 100%.

Table 7. Nonanalytic Case Types Reported to Central Registries

Response	<i>n</i>	%
None	19	8.4
Specific case requests	41	18.1
Reportable by agreement	115	50.1
Class 30+	165	73.0

Concurrent Abstracting

As seen in Figure 6 and Table 8, most of the registries reporting (58.3%) do not perform concurrent abstracting. Approximately half of those that perform concurrent abstracting (19.3%) complete it after 3 months but within 4 months, with only 7.0% completing it within 1 month.

Figure 6. Concurrent Abstracting

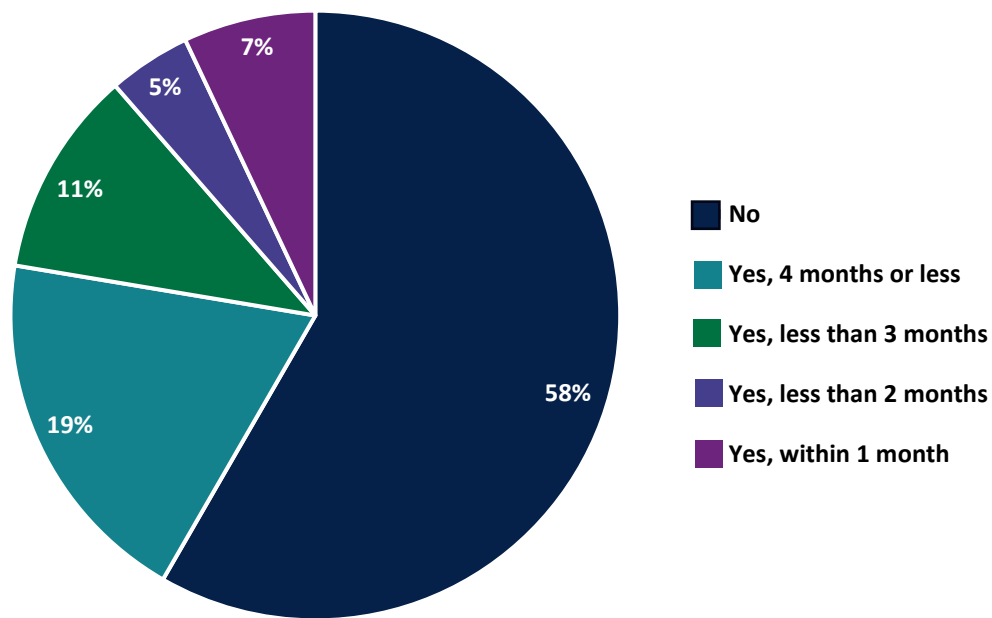


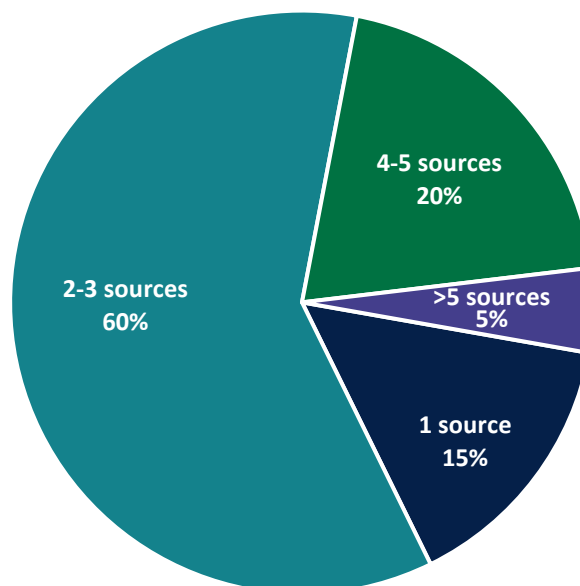
Table 8. Concurrent Abstracting

Response	<i>n</i>	%
No	133	58.3
Yes, 4 months or less	44	19.3
Yes, less than 3 months	25	11.0
Yes, less than 2 months	10	4.4
Yes, within 1 month	16	7.0

Follow-Up

Approximately 95.2% of the 228 respondents reported that they conduct follow-up. Most registries reported a combination of active/automated and passive follow-up (43.9%) or active follow-up only (41.2%). Some said they completed only passive/automated follow-up (10.1%).

Some 93.0% percent of the respondents reported that their follow-up is not outsourced. Figure 7 shows the number of sources used for follow-up, with 60.3% percent of the respondents reporting using two to three sources.

Figure 7. Number of Sources Used for Follow-Up

Staff Training Needs

Table 9 shows the results of registries responding about staff training needs. Registry leads reported that nearly half (49.1%) of their staff need additional training in data analysis, and about one quarter of their staff need additional training in case finding software and abstracting software.

Table 9. Staff Training Needs

Training activity	Mean, %	Median, %	Standard deviation	<i>n</i>
Data analysis	49.1	50	31.9	114
Case finding software	26.5	20	25.8	101
Abstracting software	24.4	14	27.3	123
Follow-up, if applicable	23.3	12	27.4	97

Staffing Concerns

When asked about concerns regarding staffing, the registry leads reported the top concerns as recruiting qualified staff, compensating effectively (relative to staff retention), and funding additional positions. The respondents were least concerned with providing workspace, providing equipment and resources, and tracking staff productivity. See Table 10 for these and additional data.

Table 10. Staffing Concerns

Staffing concern	% Very concerned	% Somewhat concerned	% Not concerned	<i>N</i>
Recruiting well-trained staff	61.7	25.9	12.4	193
Compensating staff well enough to retain them	54.2	28.1	17.7	203
Funding additional positions	47.6	29.4	23.0	187
Allocating time for training	35.8	33.7	30.6	193
Training newly certified staff*	33.7	37.4	29.0	190
Funding ongoing training	27.3	31.8	40.9	198
Tracking productivity of staff accurately and fairly	15.2	36.6	48.2	197
Procuring equipment and other resources	7.2	25.8	67.0	194
Providing adequate workspace	6.0	13.1	80.9	183

* The wording of the original question was "Training new CTRs."

Work Climate and Staff Engagement

Table 11 presents data about work climate and staff engagement. Most registry leads reported that staff burnout and staff retention were their top concerns. Respondents were least concerned with security of the remote workplace, completeness of work, and adequate knowledge and skills for carrying out assigned tasks.

Table 11. Work Climate and Staff Engagement

Work climate or staff engagement concern	% Very concerned	% Somewhat concerned	% Not concerned	N
Staff burnout	31.1	42.7	26.2	206
Staff retention	23.3	41.6	35.2	202
Staff engagement and cohesion	14.2	35.3	50.5	204
Accuracy of their work	14.2	35.1	50.7	205
Completeness of their work	11.8	32.4	55.9	204
Speed of their work	11.2	42.9	45.9	205
Motivation/morale	11.2	37.9	51.0	206
Adequate skill or knowledge to carry out assigned tasks	8.8	37.6	53.7	205
Security of their remote workspace	4.9	12.8	82.4	204

Work Site: Before, During, and After the COVID-19 Pandemic

Table 12 presents information about staff work site locations before, during, and after the COVID-19 pandemic. About one fifth of registries reported that most of their staff worked on-site before the pandemic (20.4%); this figure dropped to 11.3% during the pandemic. After the pandemic, registries with staff working mostly on-site rose to 17.5%, a figure more closely approaching the reported prepandemic level. The percentage of registries with staff who worked about equally on- and off-site before the pandemic (45.0%) dropped to 7.1% during the pandemic and remained low at 7.6% after the pandemic, reflecting that many staff members went fully remote during the pandemic and continued working remotely even after.

Table 12. Work Site Locations

Location	% Before pandemic	% During pandemic	% After pandemic	N
Most worked on-site	20.4	11.3	17.5	211
About equally on-site and remote	45.0	7.1	7.6	212
Most worked remotely	34.6	81.6	74.9	211

Cancer Registrar Survey Data

This section summarizes cancer registrars' responses to the Cancer Registrar Survey (CRS), which asked registrar staff about their workload and experiences in the registrar profession as well as the amount of time they spent on daily, weekly, and annual activities. There were 290 CRS responses. Not all respondents answered every question.

Employment

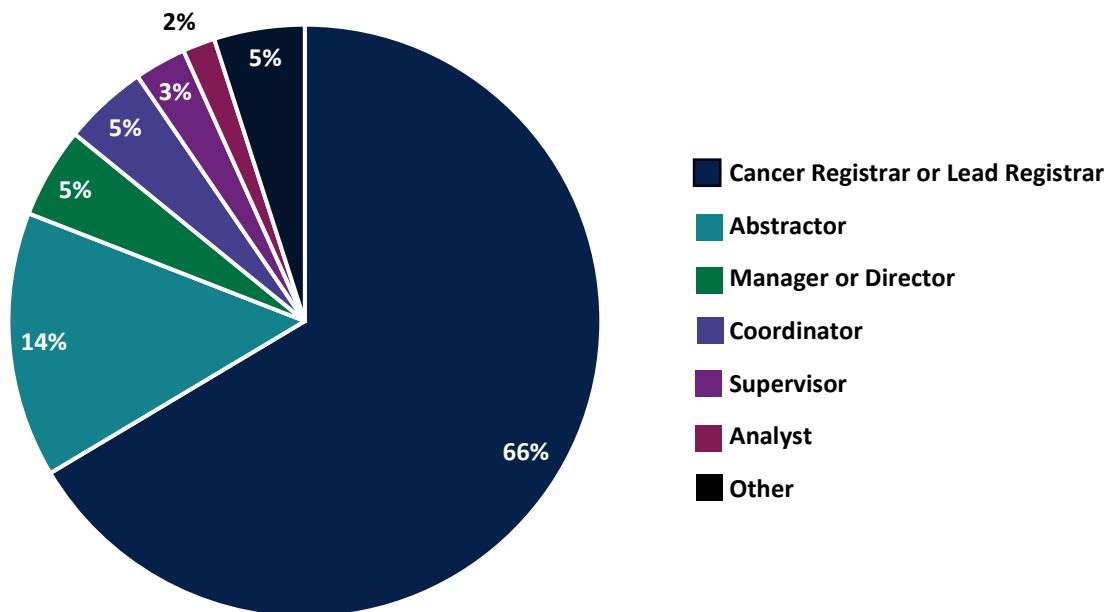
About 14.8% of the respondents worked for more than one registry (43 of 290 respondents). Almost all the respondents (97.5%) were facility employees (as opposed to contract employees). Because only 7 respondents indicated they were contract employees, a separate section to analyze contract employees alone is not included in this report.

Some 89.8% of 285 respondents reported working full-time, which is defined here as 35 hours per week or more. About 11.9% said they worked over 40 hours per week, and 7.0% said they worked 30 hours or fewer per week.

Job Title

Regarding job title, 66.4% of the 283 responded that their title is "cancer registrar" or "lead registrar." The next most reported job titles were "abstractor" (14.7%), "manager" or "director" (5.0%), or "coordinator" (4.7%). Less commonly chosen job titles were "supervisor" (2.9%), "analyst" (1.8%), and "other" (5.0%). These data are shown in Figure 8. Those respondents who selected "other" and indicated they were a "lead" registrar were reclassified as "lead registrar" and grouped with cancer registrars in the following tables and charts.

Figure 8. Job Title



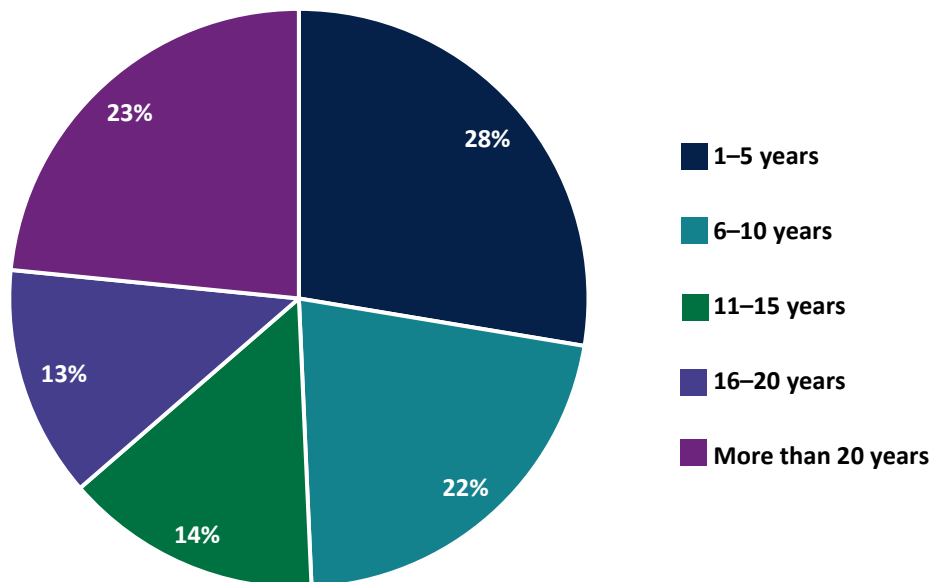
Credential Status

Most respondents (87.7%) reported that they held the Certified Tumor Registrar (CTR) credential.¹

Years in Profession

Among the 286 respondents for this question, representation of registrars spanned those who were newer to the profession, those in midcareer, and those close to retirement. Figure 9 shows that a plurality of respondents (27.6%) were in the profession for 1–5 years; 21.7% were in the profession for 6–10 years; 14.3% for 11–15 years; 12.9% for 16–20 years; and 23.4% of respondents reported working more than 20 years in the profession.

¹ In 2024, NCRA renamed the CTR credential; it is now the Oncology Data Specialist (ODS) credential. This survey was fielded in 2023.

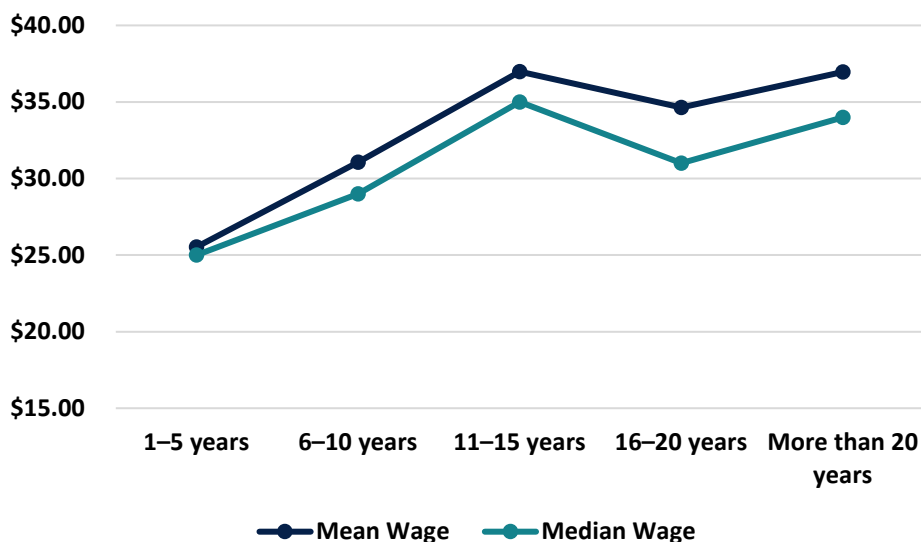
Figure 9. Years in Profession

Retirements and Exits from the Profession

Of the respondents, 17.8% said they plan to leave the profession in the next 5 years. Some 14.5% said they are leaving due to retirement, and 3.3% said they are leaving for other reasons. Another 13.8% said they were not sure they will leave in the next 5 years, and 68.5% said they will still be in the profession in 5 years.

Wages

Figure 10 shows mean and median wage by years in profession. The median was \$25.00 per hour for respondents with 1–5 years of experience, \$29.00 per hour for respondents with 6–10 years of experience, \$35.00 per hour for respondents with 11–15 years of experience, \$31.00 per hour for respondents with 16–20 years of experience, and \$34.00 per hour for respondents with over 20 years of experience. These figures include all CRS respondents, regardless of job title.

Figure 10. Reported Wages by Time in Profession

Respondents also reported their wages by their self-reported job title, as summarized in Table 13. Those who responded “other” and indicated their role as lead registrar in their free-response comment were grouped into the cancer registrar or lead registrar category. The highest wages were reported by managers or directors at \$53.00 per hour, followed by supervisors at \$36.50 per hour. The median wage for cancer registrars or lead registrars was \$30.00 per hour, and the median wage for abstractors was \$31.00 per hour. Analysts reported a median wage of \$33.00 per hour. The lowest reported wage was for coordinators at \$29.00 per hour.

Table 13. Median Wages by Job Title

Job title	Median wage, \$	<i>n</i>
Coordinator	29.00	12
Cancer Registrar or Lead Registrar	30.00	186
Abstractor	31.00	41
Analyst	33.00	5
Supervisor	36.50	8
Manager or Director	53.00	13

Registrar Satisfaction

Most of the 284 respondents of this survey question (94.0%) claimed to be somewhat satisfied (29.9%) or extremely satisfied (64.1%) with the profession, while only 3.5% of the respondents claimed to be dissatisfied with the profession.

Time to Complete High-Quality Abstracts

Respondents estimated that it takes on average 1 hour and 15 minutes to complete an abstract for a simpler case and about 2 hours and 30 minutes to complete an abstract for a more complex case. Most respondents (70.8%) said they feel they have sufficient time to complete high-quality abstracts most of the time. About 22.3% reported having enough time to complete high-quality abstracts about half the time, and 6.9% said they rarely have time to complete high-quality abstracts.

Time Spent Completing Registry Activities

As mentioned in the Methods section, one component of the CRS is an activity log that asks respondents to record their work activities and track the amount of time spent on those activities each day for one working week. Responding registrars completed the time-tracking activity log and/or answered a similar question in the CRS where they estimated their time spent on certain daily and annual activities. The responses to these questions were combined and are summarized in Tables 14 and 15.

Table 14 shows the average amount of time respondents spent on case finding, abstracting, and follow-up daily. Not all respondents engaged in all activities. There were 157 respondents who indicated completing daily abstracting work, and the mean amount of time spent abstracting was 6.8 hours per day. Seventy-eight respondents indicated completing daily case finding work, spending a mean of 3.5 hours per day on this activity. Fifty-four respondents indicated conducting daily follow-up work, and the mean amount of time spent on the task was 2.4 hours per day.

Table 14. Registrar Time Spent on Daily Activities

Daily activity	Mean estimated time, hours	<i>n</i>
Case finding	3.5	78
Abstracting	6.8	157
Follow-up	2.4	54

As seen in Table 15, the three annual activities that respondents reported spending the most time on were activities related to the CoC survey (85.7 hours, on average), database management (55.8 hours, on average), and cancer committee responsibilities (55.4 hours, on average). The activities for which most respondents reported spending any time on included staff meetings ($n = 246$), training and development ($n = 204$), and cancer conference/tumor board responsibilities ($n = 188$).

Table 15. Registrar Time Spent on Annual Activities

Annual activity	Mean estimated time, hours	<i>n</i>
COC survey	85.7	156
Database management	55.8	140
Cancer committee	55.4	174
Cancer conference/tumor board	47.8	188
Staff meetings	35.0	246
Training/development (including travel time)	32.2	204
Research	10.8	136
Working with community groups	1.7	129

Staffing Analysis and Recommendations

Based on regression analysis of the RLS responses, we ascertained that the predominant consideration for determining staffing needs lies with registry caseload. Another consideration for assessing staffing levels is the registry type (i.e., single-institution or multi-institution registry). The primary functions of most registrars are to perform case finding, abstracting, and follow-up. When making staffing decisions, individual registries may want to also consider the years for which they are currently abstracting, the amount of time to complete a case, and whether they are meeting requirements for completion times.

While caseload is a main driver for determining staffing levels, caseload varied by registry type. In Tables 16–18, registries are grouped into categories based on registry type and total accessioned cases, which include analytic and nonanalytic cases. The high group includes registries with the highest 25% of total accessioned cases, the medium group includes registries with the middle 50% of total accessioned cases, and the low group includes registries with the lowest 25% of total accessioned cases.

Table 16 shows the mean number of accessioned cases by registry type in 2022. For single-institution registries, the mean for the high group was 4,674 cases, whereas for multi-institution registries, the mean for the high group was 13,371 cases.

Table 16. Mean Total Accessioned Cases, 2022

Caseload group	Multi-institution registry	Single-institution registry	All
High (Top 25%)	13,371 (19)	4,674 (30)	8,046 (49)
Medium (Middle 50%)	3,394 (39)	1,144 (61)	2,122 (100)
Low (Bottom 25%)	1,101 (21)	320 (31)	635 (52)
All	5,184 (79)	1,803 (122)	3,132 (201)

Note. The number of observations for each group is given in parentheses.

Table 17 summarizes the mean budgeted staffing levels for a range of caseloads by registry type. Multi-institution registries had higher numbers of budgeted FTEs over single-institution registries (11.0 and 4.2, respectively). For both registry types, as caseloads increased, budgeted FTEs also increased.

Table 17. Mean Budgeted FTEs by Caseload and Registry Type, 2022

Caseload group	Multi-institution registry	Single-institution registry	All
High (Top 25%)	26.2 (17)	9.4 (28)	15.7 (45)
Medium (Middle 50%)	8.1 (39)	3.1 (59)	5.1 (98)
Low (Bottom 25%)	3.4 (18)	1.6 (29)	2.3 (47)
All	11.0 (74)	4.2 (116)	6.9 (190)

Note. The number of observations for each group is given in parentheses.

In general, single-institution registries handled fewer cases per full-time cancer registrar than multi-institution registries. As seen in Table 18, the larger the caseload, the higher the number of cases per budgeted full-time cancer registrar.²

² Approximately 88% of respondents reported that they held the CTR credential. See section Credential Status in Cancer Registrar Survey Data.

Table 18. Mean Total Accessioned Cases per Budgeted Full-Time Cancer Registrar by Caseload and Registry Type, 2022

Caseload group	Multi-institution registry	Single-institution registry	All
High (Top 25%)	620 (17)	583 (28)	597 (45)
Medium (Middle 50%)	486 (39)	405 (59)	437 (98)
Low (Bottom 25%)	382 (18)	239 (28)	295 (46)
All	492 (74)	408 (115)	441 (189)

Note. The number of observations for each group is given in parentheses.

Registry Completion Rates Within 6 Months

An additional consideration for staffing is the abstracting years completed. From 2019 to 2022, the percentage of registries that had completed more than 75% of their accessioned cases in less than six months³ increased from 30.3% to 41.3% (Table 19).

Table 19. Percent of Accessioned Cases Completed in Less Than 6 Months

Year	25% or less	More than 25% up to 50%	More than 50% up to 75%	More than 75% up to 100%	<i>n</i>
2019	28.4	16.1	25.1	30.3	211
2020	23.3	21.4	21.4	33.8	210
2021	23.8	19.1	18.6	38.6	210
2022	28.6	11.7	18.5	41.3	206

³ Although the survey asked respondents to report completion rates within 6 months, it should be noted that reporting timeliness varies. [For most state registries, reporting timeliness to central registries is within 6 months of diagnosis.](#) The National Cancer Database (NCDB) is in the act of changing their processes and requirements.

Time to Complete Cases

Another consideration for staffing is the amount of time it takes to complete cases. As seen in Table 20, the estimated time to complete simpler cases also varied by registry type and caseload. Single-institution registries estimated slightly shorter times to complete simpler cases than multi-institution registries, and for both registry types, those with smaller caseloads tended to estimate shorter times to complete cases. Lower-volume registries estimated shorter times to complete simpler cases than higher-volume registries.

Table 20. Mean Time in Minutes to Complete Simpler Cases by Caseload and Registry Type, 2022

Caseload group	Multi-institution registry	Single-institution registry	All
High (Top 25%)	68.0 (19)	65.2 (29)	66.3 (48)
Medium (Middle 50%)	66.5 (38)	57.5 (61)	60.9 (99)
Low (Bottom 25%)	60.0 (20)	53.9 (30)	56.3 (50)
All	65.2 (77)	58.5 (120)	61.0 (197)

Note. The number of observations for each group is given in parentheses.

The RLS respondents reported an overall mean of 61 minutes to complete simpler abstracts, whereas the CRS respondents reported a higher estimate of 75 minutes. For more complicated cases, RLS respondents estimated the time to complete a case to be about 1 hour and 30 minutes on average. This value, too, was lower than that of the CRS respondents, who reported that more complicated cases take about 2 hours and 30 minutes to complete. A table of estimates for more complicated cases is not provided because no clear patterns or differences emerged by type or caseload size of registry.

At the time of the RLS (March to May 2023), most registries had completed more than 95% of their cases from the years prior to 2023. About 56.8% of registries had completed cases for the years 2019–2021, and another 13.7% had completed cases for the years 2019–2022. For registries still abstracting for years prior to 2021 at the time of the survey (29.5%), additional staffing may be warranted.

Staffing Recommendations

Staffing guidelines for a particular registry vary by several registry characteristics:

- type (single or multi-institution),
- caseload size,
- current abstracting years,
- percentage of cases completed within 6 months, and
- amount of time needed to complete abstracts.

Beginning with registry type and caseload size, the following staffing guidelines should serve as a starting point for making decisions regarding budgeting for the number of full-time cancer registrars. Simple linear regression analyses were conducted to determine the average number of FTEs needed for a given caseload for the two registry types, presented below. These values will vary due to other factors, such as completion rates and current abstracting years.

- For single-institution registries, for every 1,000 cases, staffing should increase by 1.8 to 2.1 FTEs, on average.
- For multi-institution registries, for every 1,000 cases, staffing should increase by 1.6 to 1.9 FTEs, on average.

Survey Data Summary

The RLS and CRS respondents represented registries from all 10 HHS regions, single- and multi-institution registries, registries with varying caseloads, and registrars in their early to late careers with a range of responsibilities and job titles. The key takeaways from the CRS and RLS are presented in the following sections.

Registry Lead Survey

- About half (51.3%) of the registries had productivity standards in place for all positions. This varied by registry type, with 61.3% of multi-institution registries and 45.0% of single-institution registries having productivity standards for all positions.
- The mean number of FTEs for registry staffing was 6.8, varying by registry type and caseload size.
 - Single-institution registries had mean numbers of registry staff varying from 1.6 to 9.4 for smaller to larger caseloads, with an overall mean of 4.2 FTEs.
 - Multi-institution registries had mean numbers of registry staff varying from 3.4 to 26.2 for smaller to larger caseloads, with an overall mean of 11.0 FTEs.
- The mean number of cases per FTE was 441, varying from 295 to 620 cases, given registry type and caseload size.
- The mean estimated time to complete a simpler case was 61.0 minutes, ranging from 53.0 to 68.0 minutes depending on registry type and caseload size.

Cancer Registrar Survey

- Some 85.2% of registrar respondents reported working for one employer, and 99.8% reported working full-time, which was defined as 35 or more hours per week.
- Of the registrar respondents, 94.0% reported feeling satisfied or highly satisfied with the profession.
- Median wages varied by length of time in profession and job title:
 - The reported median wage was \$25.00 per hour for respondents with 1–5 years of experience. For respondents more than 20 years in their career, the median wage was \$34.00 per hour.
 - The reported median wage for cancer registrars was \$30.00 per hour, and for abstractors, \$31.00 per hour.
- For registrars who abstracted, the mean time spent abstracting was 6.8 hours per day.
- The mean time spent on CoC survey activities was about 85 hours per year (about two full-time weeks).

Comparison to the 2011 NCRA Workload and Staffing Study Summary Report

This section compares aspects of the current study to the previous study. This comparison includes the following components:

- a comparison of methods,
- a summary of the prior study staffing guidelines, and
- a table of key findings from the prior study along with similar findings in the current study.

Methods Comparison

The methods used in the 2011 study differ from the current 2024 study in the following ways:

- The study population in 2011 was from CoC-accredited programs, whereas this 2024 study population was the self-identified lead registrars of hospital-based registries from the NCRA member database.
- The 2011 study restricted respondents to those with caseloads of 200 or more, whereas this 2024 study had no minimum requirement for registry caseload size.
- The 2011 study collected registry data from 2004 to 2006, and this 2024 study collected data from 2019 to 2022.

2011 Staffing Guidelines Summary

Comparisons between the 2011 staffing guidelines and this current study are limited by their differing survey designs, samples, and items. A few comparisons, however, show growth in caseloads and some similarities in estimated caseload per registrar.

Staffing guidelines from the 2011 summary report were primarily based on the number of new cases, with considerations for time spent on nonabstracting activities. This 2024 study takes similar measures but breaks down the guidelines by type of institution and from low-to-high caseload groupings.

The 2011 summary showed that for registries with 101 to 500 cases, the mean FTEs was 1.6. The suggested increase in staffing was 1 additional FTE for each additional 500 cases. Additional FTEs varied by desired completion rates and additional duties required of staff, such as follow-up, case finding, and work completed for other departments.

Both studies aimed to help cancer registries address the question of how their registry compares with others in terms of caseload, completion rates, active follow-up cases, and staffing levels. The 2011 study relied on detailed data on registrars' time spent on various daily and annual activities, whereas this 2024 study provides less detail on registrars' daily workload but offers additional data on registrar characteristics, such as time in the profession, time to complete cases, and feedback around stress and burnout.

Key Findings

Table 21 presents key findings from the 2011 summary, but the findings presented here are not exhaustive. For more detailed information, please refer to the [prior report](#).

Table 21. Key Comparisons Between the 2011 and 2024 Studies

2011 Study	2024 Study
The mean number of new accessioned cases in 2007 was 1,313.	The mean number of accessioned cases in 2022 was 3,132.*
The mean number of follow-up cases in 2007 was 8,003. The median was 5,394 cases, and the range was from 223 to 70,000 cases.	The mean number of follow-up cases in 2022 was 18,270. The median was 8,917 cases, and the range was from fewer than 100 to more than 100,000 cases.
The mean number of new cases was 475 per FTE; of those, the number of cases meeting timely completion rates was 386 per FTE.	The mean number of cases per FTE was 441, ranging from 295 for single-institution registries with low caseloads to 620 for multi-institution registries with high caseloads.**
Nearly two-thirds (67%) of cancer registries operated with 2 or fewer FTEs.	In 2022, the mean number of FTEs was 6.9 per registry, ranging from 1.6 for single-institution registries with low caseloads to 26.2 for multi-institution registries with high caseloads.

* This difference may be reflective of the difference in the survey populations but may also indicate other shifts in the registry industry.

** A direct comparison to those meeting timely completion rates is not available.

A comparison of the key findings shows an increase in accessioned cases, an increase in cases in follow-up, and an increase in FTEs. These increases may point to a shift in registry makeup due to consolidation and increased reliance on automation and contract staff. They may also be due to the varying study populations included because of the different methods used for each study.

Interview Data

This section presents findings from postsurvey interview data.

Postsurvey Interviews

A total of 11 interviews were conducted with researchers, national cancer data standard setters, experienced cancer registrars, cancer registry software developers and providers, and cancer registry contracting representatives.⁴ Through qualitative analysis of the postsurvey interviews, the following themes emerged:

- completion time for abstracts
- staffing practices and vacancies
- educating the workforce
- technology's impact on the workforce

⁴ Additional information about these interviews can be found in the Methods section.

- promoting the profession
- importance of the workforce
- interviewee recommendations for future workforce

Completion Time for Abstracts

Interviewees reported that data abstraction is a complex process that requires data to be pulled from multiple sources, such as pathology reports, radiology reports, medical and radiation oncology reports, EHRs, and surgical notes. One interviewee estimated that the average abstract requires data from eight to nine different facilities to be considered complete.

Several factors contribute to the time required to complete an abstract. The factors vary by registry as well as by a registrar's abstracting experience and include, but are not limited to, meeting different data collection requirements, accessing data sources, and accessing technologies that assist with data collection. Because of these variations, one interviewee noted it is often difficult to compare the time needed to complete an abstract across cancer registries.

According to findings from the RLS, lead registrars estimated that abstracting a simple case takes about 1 hour to complete and that abstracting a more complex case takes about 1 hour and 30 minutes. According to findings from the CRS, registrars estimated that abstracting a simple case takes about 1 hour and 15 minutes to complete and that abstracting a more complex case requires about 2 hours and 30 minutes.

These findings were presented to interviewees for their reactions. Several interviewees said the survey findings seemed accurate to them, but more than half expected that completing a complex case could take longer than 2 hours and 30 minutes. They suggested more time was needed because the increasing complexity of cancer creates additional data fields to be completed, such as information about new cancer tests and genomics.

Staffing Practices and Vacancies

A few registrar interviewees noted that they regularly conducted time studies to quantify their team's output. Collecting and presenting these time study data was integral to registrar leads' efforts in advocating for appropriate staffing levels.

The RLS found that about 24.7% of registries had vacant registrar positions. One interviewee agreed it was a struggle to fill open positions at their registry. All interviewees were asked for their opinions about contributing factors to industry-wide vacancies. Interviewees cited the following:

- low wages;
- work that often goes unrecognized and at times feels thankless (e.g., large portion of work involves investigating different sources and entering data manually; isolating work is completed remotely, often with little contact with other people or workers);
- required in-person work that drives registrars to competing organizations that can offer fully remote work;
- the significant proportion of the cancer registry workforce retiring or preparing to retire;
- lack of credentialed registrars to fill open cancer registry positions;
- requirement of workers to have developed a unique skillset that combines many areas of expertise;
- lack of future workers on the cancer registrar pathway;
- redirection of prospective and some existing workers away from the profession due to COVID-19; and
- burnout (addressed in more detail below).

Burnout. Interviewees noted they thought burnout within the profession may be attributed to several factors:

- insufficient number of people in the workforce to complete the work;
- social isolation, particularly in exclusively remote work settings;
- undervalued role; and
- unrealistic productivity standards from management, such as sometimes being forced to work at an unreasonably fast pace.

Interviewees also discussed ways in which burnout could be addressed, including

- staffing at appropriate levels,
- increasing hourly wages,
- developing and incorporating mentorship programs,
- pushing back against unrealistic expectations from management, and
- shifting the types of activities that registrars perform (e.g., away from manual data entry).

Contract Staff. The two interviewees who worked for contract organizations, both of whom were managers, relayed high employee satisfaction and retention rates within their organizations. They also expressed that several groups of individuals were attracted to their organizations, including new graduates, registrars coming from hospital registries, registrars coming from other contracting companies, and returning registrars who had previously worked for their organization.

These two interviewees from contracted organizations reported potential advantages to increasing amounts of contracted work in the industry and completely outsourced registry work. From a hiring perspective, these experts opined that contracting organizations allow for easier and faster training of new registrars and filling of vacant positions. One contract expert explained:

In a hospital situation, if someone resigns, it takes a while to fill that position, and in the meantime, every single week in a registry is valuable and every single week that someone's not there, you're falling behind. And then by the time you find someone, you need double the role to get caught up. When you have contracting in place, if someone were to leave, we have people who are ready. We can always find someone to pick up that work, or we can fluctuate staffing. There are just a lot more opportunities with staffing. In a hospital situation, you have a very small pool of CTRs. In a contract situation, you have a big pool of CTRs.

The two contract interviewees also expressed other potential benefits of contract work. In particular, they both emphasized that the quality of their data was excellent, with one contract expert saying,

A lot of times you'll hear, "Oh, well, contractors don't have as good of quality." And I actually think it's opposite of the truth. I'm not saying that it's better quality than necessarily that specific hospital, but I know that our company has high quality and we're always keeping abreast with the changes, which is so crucial when it comes to the type of work we're doing. It's data that is being utilized. It's outcomes data. It is very important.

In addition, the contract interviewees detailed the lengths they take to train new registrars. One interviewee explained that some hospitals contracted with them simply to help train their registrars. These interviewees explained that their contracting organizations provided jobs to noncredentialed registrars and guided them through the credentialing process as well as provided on-the-job training, sometimes in the form of an internship. One interviewee described the importance of training registrars:

I think that for a couple of years, we had heard that our competitors were not willing to hire individuals with less than three years' experience. And so that was one of the things that, for me, was the gap that we could fill, because those individuals really do need the education. It's one thing to go through the schooling, but it's another thing to have the hands-on experience. Cancer is so complicated that you need to be in those medical records to understand all the nuances. The book learning is important, but the hands-on really makes it a career, right? You really have to understand how to maneuver around those abstracts and to understand which fields are important and what information to collect on these patients.

Other areas in which contract interviewees felt that contracting benefited registry work included

- using past experiences to inform processes and create sets of “best practices” that can be broadly applied to registries,
- prioritizing continuing education that often includes quality control exercises,
- providing an improved work culture, and
- offering more career pathways (e.g., data analysts, data quality analysts, data quality managers, project managers, senior managers, and service leads focused on CoC standards).

Noncontract interviewees described some of their experiences with contract staff as challenging, however, often citing that the quality of work was not on par with what was expected or needed. One interviewee said,

The bottom line is that the quality [of work completed by contract staff] is so bad that I didn't even want to send it to the state. We ended up having to redo a lot of their work. So not only did we pay top dollar for the abstracts, but now we had to redo most of them.

This interviewee also observed that some of the contracted registrars they had worked with were doing the work as a second job; it appeared as though the contracting job was not given as much time and attention as needed and that there was a lack of supervision over the contracted employees. This interviewee also noted experiences with contracted registrars charging for more time than the amount of work produced should have taken. In addition to explaining their own frustrating experience with contract workers, this same interviewee expressed some of the administrative challenges associated with funding registrar positions, stating,

When we lost three of our [registrars] . . . I had said . . . to [our] administrators . . . “If you give me a big bucket of money . . . just for contractors,” which [the administrators] did, “that's not going to alleviate the problem.” So I had the money, the funds in the budget—couldn't use it for salaries, of course. If [the administrators had] just given my [registrars] a few extra bucks an hour, but they didn't. They gave me this big whopping amount of money to use for contractors because it was out of a different cost center or something. . . . It wasn't operational or capital—it was something else. So I had to get contractors, and it was my third time. My third and last time working with contractors. I will never work with contractors again.

Educating the Workforce

The registrar interviewees described the various entry points to the profession. Currently, [there are three main pathways](#) that prospective registrars can follow to enter the cancer registrar profession. Although this allows for flexibility, some interviewees stated that the lack of a single, standardized entry point makes it unclear which way is the “best” way to become trained. Interviewees also commented that the current educational requirements (e.g., associate degree) could limit the types of tasks that registrars perform as well as their earning potential.

Some interviewees advocated for changes in how registrars are educated. Considering emerging software innovations, interviewees noted the importance of learning how to use these technologies and staying updated on them, given the rapidly changing environment. One interviewee explained that registrars should also have a general understanding of how artificial intelligence (AI) works:

I think there needs to be some core training on maybe just the basics of artificial intelligence. We find ourselves trying to teach people what the AI engine is and what it does. And a lot of hesitancy I think is because they just don't know. . . . A couple of weeks ago . . . I did basic AI training on case finding and abstracting, and to understand what its strengths and limitations are, to not be afraid of it but then also how to leverage that for your career. And I think that's the piece that we are totally missing right now. I don't see any registrar coming into the field now and not needing to know about this.

In addition, some interviewees felt that education programs should provide more content that covers quality assurance/quality control and data analytics as the profession continues to evolve with technology. Interviewees also noted the importance of continuing education in this field. Changes and innovations in technology, cancer treatments, data collection, and reporting rules require that registrars remain vigilant in understanding what is expected of them to properly fulfill all registrar duties.

Technology's Impact on the Workforce

Interviewees felt strongly that technological innovations and automation will not eliminate the registrar's role. Rather, they explained that the implementation of new software programs will automate some tasks (e.g., case finding, data collection) and facilitate their completion. Interviewees continued to explain that registrars could apply this recovered time to other aspects of the work, such as quality control/quality assurance, data analytics/informatics, concurrent abstracting, specialization (e.g., pharmacology, pathology), and leadership functions. The interviewed software vendors emphasized these points, with one saying:

The promise of NLP [natural language processing] or AI is that, hey, it is going to automate everything. The fine print is, oh by the way, the accuracy level is anywhere between 80 and 90 percent. Oh, by the way, in healthcare, that's not good enough. And so if you use these technologies but then have humans going back in and verifying everything that you're doing, you're really not providing the panacea of technologies, my frame of reference. And so I see [our software company] being very measured in how we leverage these technologies in a manner that still keeps the human as the primary decision point for any information that's there in that abstract.

Another interviewee said:

I think, hopefully, studies like this can validate the role and can assuage fears that it may be a diminishing role because of AI, because of technology. And so I think we need to find some way to fight against the perception that [cancer registrars are] going to be replaced. Personally, I don't think that's necessary. I don't think that should be a fear. I think that it should be a reality that these are valuable people. They just need to be used differently. Automation should make their job easier and should allow them to be able to really make sure that the data is accurate and timely and work with the automation, rather than expecting it just to be a replacement.

Although new technologies are promising, interviewees noted several potential barriers to their implementation:

- Some workers, especially those who have been practicing a long time, may be hesitant or resistant to new technologies.
- Technologies can take time to develop fully.
- Some registries face financial or budgetary constraints. Particularly true for smaller programs that may not be as well resourced, such constraints could have data implications that reinforce existing disparities and raise equity concerns.
- Facilities and hospitals may not be equipped to handle technological changes, even if registries are equipped for these changes.

Some interviewees also spoke about other technologies not yet widely used or in earlier stages of development that could benefit the registrar profession. For example, one registrar discussed the advantages that voice recognition software could bring to the industry; less time spent sitting at the desk provides more opportunities for workers to be active while also completing their work.

Promoting the Profession

Despite the challenges associated with filling vacant registrar roles, interviewees also discussed positive aspects of the profession that often draw people to registrar work:

- flexible hours (registrars can often work whenever they wish),
- remote work opportunities, and
- high employee satisfaction, with workers tending to stay in the profession for the entirety of their careers.

The interviewees also discussed the importance of promoting the profession to attract new people and increase the number of people on the path to becoming registrars. Interviewees hoped that marketing efforts, especially on social media platforms, could increase awareness of the profession and enlighten other health care professionals about how working with cancer registrars might benefit their work. Furthermore, interviewees felt that predicted shifts in registrar work, such as the development of more specialties (e.g., data analytics), career paths, and education programs, would also make the profession more attractive to prospective students.

Importance of Workforce

Most interviewees emphasized the importance of cancer registrars' work. One said, "Registrars make the world go round. Without them, there would be nothing. If you go to our . . . data website, there would be nothing there if it wasn't for them."

The interviewees spoke about the value that registrars currently provide, such as collecting data in an accurate and timely fashion, reporting those data to the national cancer databases, and sharing public health data. Moreover, they reported that the importance of their role will only increase as they continue to focus more on data interpretation and evaluation, which interviewees said can—and should—be used at the facility or hospital level to improve care delivery.

Despite the value of registrars and all the activities they perform, several interviewees noted they often felt that registrars did not have "a seat at the table" in conversations about cancer data and their role. Interviewees hoped to see this situation change in the future as registrars start to use collected data to make care delivery improvements at the facility and hospital level and, ideally, have time to present these data at meetings and conferences.

The interviewees noted that in some settings, however, registrars may have to “take initiative” in analyzing and presenting these data to their management, as administrators may not understand the full capability of registrars. One software vendor, a former registrar, explained:

[At] any company, even this company or any part of the registry . . . I told someone I had to learn to be scrappy in the hospital to defend what I did and explain what I did. And there’s days where you feel like you’re fighting and clawing for that. But if I can bring data in front of someone who needs to treat their patient better, or if I can put data in front of an administrator that says, “We have a gap in our referral process here” or “We’re spending too much money over here” or “We don’t have the right service,” then I’m ensuring my seat at that table as part of the leadership team.

The same interviewee expressed additional details about the types of work they see cancer registrars performing in the future:

We also want to expand out into doing the oncology dashboards, KPIs [key performance indicators], metrics. We want to help people that belong to research consortiums and are collecting additional data that way. But we want to involve the whole cancer program and the oncology informatics space. Because without that, I just don’t see—I love what I do, but unfortunately the registrar’s work doesn’t get the attention it needs unless you can apply it to the bigger program. So the buzzwords I keep seeing and hearing are “clinical” and “business intelligence.” Are we giving them information that has real meaning that they can take action on right at that point? Because if a doctor or a physician can say, “Wow, this is not best practice, this outcome doesn’t line up with best practice,” [they] can immediately change [their] practice. Versus how we did it before, you were waiting one, two years behind the fact. So I think that’s where it’s going to be most impactful.

The interviewees also noted they wanted to see more investment in the workforce generally, which could have particularly positive implications for data quality. One registrar said:

The biggest thing I feel is that we need more investment as a whole in an industry and quality, because our data is very important and it’s only as good as what we put in the database. And what we’re doing, it’s important, so we need more investment in quality, whether that’s having a quality education and trainer in each facility or each region or something. They’re more than just like a webinar. The webinar teaches, but who’s checking? I totally get why it doesn’t happen. I was in the same conundrum in my previous job. We couldn’t do quality because there wasn’t money to do it, so I get why it doesn’t happen. And sometimes people are pushed to meet productivity expectations that are not super realistic, but they have to meet them. If not, their job will reflect it, and then their quality suffers.

Interviewee Recommendations for Future Workforce

The interviewees predicted many impending changes to the cancer registrar’s role. Most interviewees acknowledged the upcoming name change of the credential from Certified Tumor Registrar (CTR) to Oncology Data Specialist (ODS) as indicative of other changes in the profession in the coming years. One interviewee said:

The cancer registration field in 5 years will not look like what it looks like now. It can’t, because we’re at the breaking point. [The registrars] probably told you that, too, when you’re out there talking to them: “We can’t do much more.” I’m sure they said it because we’re saying it here: “We

can't do much more." And so I think we're at that. . . . There's always a critical, what is there, like an inflection point? I think in the next 3 to 5 years, we are at an inflection point of how we get this data. Because the current way we do it, I think, is unsustainable.

Envisioning specifics about how the profession will evolve, the interviewees shared several ideas:

- New technologies will automate certain processes and recover time that can be spent on other job functions, with a focus on analytics to use data at the facility level, which will ensure that registrars have a voice in decision-making.
- More education will be developed and implemented to support new technologies.
- New and varied career paths and ladders will emerge.
- The industry will focus on growing the contracted workforce.

For improving staffing issues in the short term, the interviewees made additional recommendations. Two suggestions were conducting more time studies to help managers advocate for appropriate staffing levels and prioritizing legacy and succession planning as skilled registrars begin to retire from the workforce.

Summary of Interview Data

Eleven interviews with experts and leaders in the cancer registry industry were conducted to explore their perspectives on what some of the survey findings might mean for the future of cancer registry work, workforce development, skills training, and maintenance of skills. The interviewees commented that certain factors, such as low wages and increased burnout, are likely contributing to vacancy rates within the industry. Advancements in medicine and technology have affected and will continue to affect the registrar profession in new ways, and although interviewees felt that these advancements would change the role of cancer registrars, they did not perceive that these innovations would eliminate the profession. The interviewees also shared short- and long-term recommendations to support the evolving workforce, such as improving legacy planning efforts and enhancing education to support the learning and adoption of technologies. In general, the interviewees held that cancer registrars are vital to collecting and reporting cancer data and will play a critical role in advancing how cancer data are used.

Conclusion

This study reports the findings from two different surveys, the Registry Lead Survey (RLS) and the Cancer Registrar Survey (CRS). It includes a staffing analysis and staffing guidelines. The results of this study should help guide registries in making staffing decisions based on their registry characteristics and provide some industry information for registries to compare themselves with when making staffing decisions.

This report also presents findings from interviews conducted with several experts and leaders in the cancer registry industry. The interviewees were asked to comment on several key survey findings, but they also shared details about their broader experience working as or with cancer registrars. These interview data demonstrate the diverse opinions and experiences that permeate cancer registry work.

Recommendations

As the national association representing cancer registrars, NCRA alone cannot implement these recommendations. Federal partners, standard setters, and other national cancer registry associations that have leadership and regulatory authority in the cancer data field will need to partner with NCRA to realize these recommendations:

-
- Consider developing advanced credentials to address the innovations in cancer diagnosis and treatment and in technological advancements that will continue to impact the work and responsibilities of cancer registrars.
 - Develop education and training models to address future changes in cancer registrars' roles and responsibilities, such as informatics, data management, quality control, real-time reporting, and data analysis and presentation.
 - Consider having registries with experience developing and utilizing productivity standards share their methods and analytic tools with registries that would benefit from applying these standards to better monitor their own workload and advocate for needed staffing.
 - Consider ways to increase concurrent abstracting as key industry leaders and standard setters call for increased real-time data.
 - Develop and implement policies and programming that will advance the cancer registry workforce.
 - Conduct additional research to provide cancer registry managers with real-time workload data and trends to inform staffing needs and guidelines.

Acronyms

ACAD: Academic Comprehensive Cancer Program

ACS: American College of Surgeons

AI: artificial intelligence

AJCC: American Joint Committee on Cancer

CCCP: Comprehensive Community Cancer Program

CCP: Community Cancer Program

CDC: Centers for Disease Control and Prevention

CoC: Commission on Cancer (of ACS)

CTR: Certified Tumor Registrar

EHR: electronic health record

FTE: full-time equivalent

FY: fiscal year

HACP: Hospital Associate Cancer Program

HHS: U.S. Department of Health and Human Services

INCP: Integrated Network Cancer Program

IRB: institutional review board

JRM: *Journal of Registry Management*

KPI: key performance indicator

NAACCR: North American Association of Central Cancer Registries

NAPBC: National Accreditation Program for Breast Centers

NAPRC: National Accreditation Program for Rectal Cancer

NCDB: National Cancer Database

NCI: National Cancer Institute

NCIN: NCI-Designated Network Cancer Program

NCIP: NCI-Designated Comprehensive Cancer Center Program

NCRA: National Cancer Registrars Association

NLP: natural language processing

NPCR: National Program of Cancer Registries (of CDC)

ODS: Oncology Data Specialist

PCP: Pediatric Cancer Program

SEER: Surveillance, Epidemiology, and End Results Program (of NCI)

UCSF: University of California San Francisco

VACP: Veterans Affairs Cancer Program

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Appendix B. Interviewees

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Appendix C. Registry Lead Survey (RLS)

Section I: Registry Characteristics

Q1 Participation in this survey is optional. Please review the information sheet regarding this research project.

[NCRA 2023 Hospital Survey Information Sheet](#)

Q2 Thank you for participating! **Please enter the anonymous UCSF-generated ID number provided in your introductory email.** (This is **not** your NPI number.)

Q3 This survey is to better understand the staffing needs of hospital-based cancer registries. Which type of registry does your current work support?

- Hospital-based cancer registry
- Central/population-based registry
- National/federal registry

Q4 As you take the survey, please click the forward arrow at the bottom of each page to **save your answers** in case you do not complete the survey in one sitting.

Q5 In which state is your registry located? (See drop-down list of states.)

Q6 Do you manage a single-hospital (institution) registry or a multi-institution registry?

- Single-institution registry
- Multi-institution registry

Q7 What type of institution does your registry serve? (Select all that apply.)

- Federal government hospital (i.e., military/VA)
- Government/Public hospital, state/county
- University hospital
- Private/Community hospital/Hospital system
- Freestanding Cancer Center Program
- Other _____

Q8 What is the total number of inpatient beds in your institution(s), both licensed and unlicensed?

Q9 What has your program's accreditation status been regarding the American College of Surgeons (ACS) during the previous 5 years? (Select all that apply.)

- My program is currently accredited.
- My program was previously accredited but is no longer accredited.
- My program is seeking accreditation or planning to seek accreditation.
- My program is not planning to seek accreditation.
- I don't know if my program is seeking or will seek accreditation.

Q10 In what categories is your program **currently** accredited? (Select all that apply.)

- Academic Comprehensive Cancer Program – ACAD (CoC)
- Community Cancer Program – CCP (CoC)
- Comprehensive Community Cancer Program – CCCP (CoC)
- Freestanding Cancer Center Program – FCCP (CoC)
- Hospital Associate Cancer Program – HACP (CoC)
- Integrated Network Cancer Program – INCP (CoC)
- NCI-Designated Comprehensive Cancer Center Program – NCIP (CoC)
- NCI-Designated Network Cancer Program – NCIN (CoC)
- Pediatric Cancer Program – PCP (CoC)
- Veterans Affairs Cancer Program – VACP (CoC)
- National Accreditation Program for Breast Centers – NAPBC
- National Accreditation Program for Rectal Cancer – NAPRC
- None of the above

Section II: Staffing and Administration

Q11 Does your registry currently have workload (productivity) standards in place?

- Yes, for all positions
- Yes, for some positions
- No, none at all

Q12 Which of the following most closely describes your job title (i.e., the job title of the person filling out this survey)? Choose the one best answer.

- Registry director
- Registry manager
- Registry supervisor
- Registry coordinator
- Team lead
- Cancer registrar
- Other _____

Q13 What is the department of the person to whom you directly report?

- Hospital/Facility Administration
- Health Information Management/Medical Records
- Pathology
- Cancer Program
- Oncology Service Line Director
- Quality
- Other _____

Q14 This question may require some research time. If your registry is very large and it is difficult to accurately track staffing, please enter estimated values.

In the table below, enter the number of full-time equivalent (FTE) cancer registrar positions funded by your registry in fiscal years 2019–2022. This includes both salaried and contract staff. Please note: Budgeted positions (a) should equal filled (b) + vacant (c) positions. That is, $a = b + c$.

	FY2019	FY2020	FY2021	FY2022
a. Number of budgeted FTE positions?				
b. Number of filled FTE positions?				
c. Of the budgeted FTE positions, how many were vacant? If none, please enter 0.				
d. Of the filled positions in (b), how many FTE positions were filled by contract staff? If none, please enter 0.				
e. Of the filled positions in (b), what were the number of temporary FTE positions? If none, please enter 0.				

Q15 Does your registry employ contract staff?

- Yes
- No

Q16 Regarding contract staff, are your contract workers paid by the case or by the hour?

- By the hour
- By the case
- A combination of cases and hours
- Other method _____

Q17 Regarding contract staff, do you feel your contract staff produces thorough and accurate abstracts?

- Mostly yes
- Sometimes
- Not usually
- Other _____

Q18 Regarding contract staff, what concerns do you have regarding the quality of your contractors' work, if any?

Section III: Caseload Size and Composition

Q19 For which years are you currently abstracting? (Select all that apply.)

- 2019
- 2020
- 2021
- 2022

Q20 Which of the following years are more than 95% completed? (Select all that apply.)

- 2019
- 2020
- 2021
- 2022

Q21 On which course of treatment does your registry abstract, if available?

	Most of the time	About half the time	Sometimes or rarely	n/a
First				
Second				
Third				
Fourth				

Q22 How many accessioned cases in your registry's most recently completed year were

Number of cases	
Analytic (00-22)	
Nonanalytic (30+)	

Q23 Approximately what percentage of the cases accessioned in years 2019–2022 were completed within 6 months of the date of first contact?

	25% or less	More than 25% up to 50%	More than 50% up to 75%	More than 75% up to 100%
2019				
2020				
2021				
2022				

Q24 What type of nonanalytic cases does your central/state registry require you to report? (Select all that apply.)

- None
- Responses to specific case requests
- Reportable by agreement
- Class 30+

Section IV: Registry Procedures

Q25 Please indicate whether your registrars spend time doing case finding with each source listed in an average week via a cancer registrar or fully automated review.

	Cancer registrar review		Fully automated review	
	Yes	No	Yes	No
Pathology reports				
Disease indices (e.g., billing codes or claim codes ICD-10)				
Treatment logs (Chemo, Radiation, etc.)				
Office visit or procedure logs (Radiology, Nuclear Medicine, etc.)				
Other source				

Q26 To which entity does your registry data get reported? (Select all that apply.)

- State/Central/Regional/Population registry
- NCI-SEER
- CDC/NPCR
- NCDB/RCRS
- DoD/Military
- Veterans Administration
- Other _____

Q27 Does your registry do concurrent abstracting?

- No
- Yes, within 1 month
- Yes, less than 2 months
- Yes, less than 3 months
- Yes, 4 months or less

Q28 Please estimate the amount of time spent creating thorough and accurate abstracts. For a range, choose the **midpoint**. **Please answer in minutes**. Example: 1 hour and 15 mins = 75 minutes

Total minutes	
Simpler cases, ex: prostate	
Complicated cases, ex: breast	

Q29 Does your registry do follow-up?

- Yes, passive or automated follow-up
- Yes, active follow-up
- Yes, passive/automated and active follow-up
- No

Q30 How many sources do your cancer registrars usually have to review in order to perform follow-up for a single case?

- 1 source
- 2–3 sources
- 4–5 sources
- More than 5

Q31 How many cases does your registry currently have in active follow-up?

Q32 Is your follow-up outsourced?

- No
- Yes, sometimes
- Yes, always

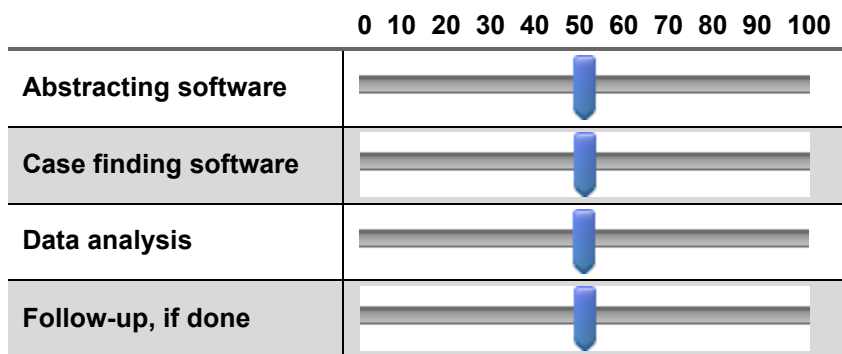
Section V: Data Management and Automation

Q33 What types of software do you use in your cancer registry for abstracting, case finding, follow-up, and data analysis? (Select all that apply.)

- Cancer registry software (ex. METRIQ, CRStar, OncoLog)
- Hospital EMR (ex. Epic, Cerner)
- Physician office EMR (ex. AthenaNet, Centricity)
- Radiation Oncology-specific EMR (ex. MOSAIQ, ARIA)
- Medical Oncology-specific EMR (ex. OncoEMR)
- ePath Interface
- Data analysis/Visualization (ex. SAS, Tableau, PowerBI)
- Microsoft Office Suite (Word, Excel, PowerPoint)
- Other _____

Section VI: Respondent Opinions and Concerns

Q34 Of the different types of software used by your registry, what percentage of your staff needs additional training? (Drag the slider to approximate.)



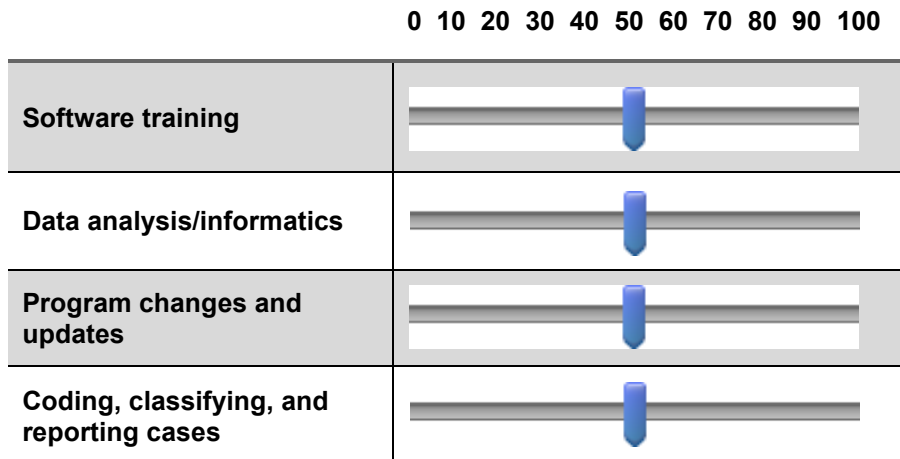
Q35 What is your level of concern regarding the staffing of your registry?

	Not a concern	Somewhat concerned	Very concerned	n/a
Training new CTRs				
Funding ongoing training for existing staff				
Allocating time for training of staff				
Compensating staff well enough to retain them				
Recruiting qualified staff				
Funding additional positions				
Tracking staff productivity fairly and accurately for management				
Providing adequate work space for staff				
Procuring equipment or other resources for staff				

Q36 Thinking about the work climate/staff engagement at your registry, how concerned are you regarding the following?

	Not a concern	Somewhat concerned	Very concerned	n/a
Adequate knowledge or skill to carry out assigned tasks				
Motivation/morale				
Accuracy of their work				
Speed of their work				
Completeness of their work				
Security of their remote workspace				
Staff retention				
Staff burnout				
Staff engagement and cohesion				

Q37 What percentage of your staff needs ongoing training/continuing education in the following topics? Do not include initial CTR training, and only include staff that needs the type of training for their position.



Q38 What is the level of need for the following resources for your staff?

	None	Low	Moderate	High
Leadership/management training				
Computer hardware				
Computer software				
Work space				
Supervisory support				
Administrative support				
One or more additional FTE registrars				

Q39 Are there other things not listed that your staff needs in order to do a better job?

Q40 Other than regular cancer registry duties, how often are your cancer registrars called upon to do work that supports the functions of noncancer departments?

- Daily
- Weekly
- Monthly
- Less than once a month
- Never

Q41 To what degree did the COVID-19 pandemic shift the workload of your cancer registrars to support necessary functions of other departments (e.g., Emergency Department functions or other nonregular registrar duties)?

- None
- A little
- A moderate amount
- A great amount

Q42 What was the primary work location of your registry staff during the following time periods?

	Regular staff location			Contract staff location (if any)		
	Most worked on-site	About equally on-site and remote	Most worked remotely	Worked on-site	Worked remotely	About equally on-site and remote
Pre-COVID (2019)						
During the pandemic/ shutdown (2020 and/or 2021)						
Currently						

Q43 The second part of the study asks you to forward the registrar activity log and survey to your registrars. It also asks you to complete the registrar activity log and survey if you currently perform registrar duties.

Please enter the number of registrars (including yourself if applicable) in your organization who will be invited to complete the Registrar Activity Log and Survey.

Q44 Thank you for your participation in this survey. Please provide any additional comments below.

Appendix D. Cancer Registrar Survey (CRS)

Q1 Participation in this survey is optional. Please review the information sheet regarding this research project.

[UCSF Activity Log Information Sheet](#)

Section I: Job Information and Activity Log

Q2 Thank you for participating! **Please enter the anonymous UCSF-generated ID number provided in the introductory email that was forwarded to you.** (This is **not** your NPI number.)

Q3 Please click here to open the survey glossary that explains many of the terms in the survey:

[Glossary](#)

Q4 Do you work for more than one registry?

Yes

No

Skip to Q6 if "Do you work for more than one registry?" = No

Q5 If you work for more than one registry, please complete the Activity Log and Survey using your work for the same registry as the registry manager who forwarded this survey to you. It is possible, though unlikely, that you will receive this survey from another employer. If this happens, we ask that you complete it once for each employer.

Q6 The next question asks you to enter your time spent on various activities for one week. Would you say the week chosen was a typical week or not a typical week for you?

Typical

Not typical

Q7 In your email, we provided you with a pdf to record your times. If you used that pdf, please transfer your times to the grid below.

In this question, we ask you to **record your actual time spent on certain work activities for a full week.** Please choose a complete work week (5 days or fewer if you work less than 5 days per week). The daily times do not need to sum to your total work day.

If you work fewer than 5 days per week, then only record activities for that number of days. For example, if you work 4 days a week, only record your activity time for the 4 days and leave the 5th day blank.

Do not include time spent on breaks or other activities not listed. If you did not spend time on a particular activity, you can leave it blank. **Please record the time spent on the following activities and then record the time spent each day using that column and round to the nearest 15-minute interval.**

Example: For 2 hours and 20 minutes, enter 2.25 for the number of hours that day.

	Day 1	Day 2	Day 3	Day 4	Day 5
Case finding					
Abstracting					
Follow-up: active/passive					
Quality: visual edits of abstracts					
Quality: consolidating records – reconciling discrepancies					
Audits: casefinding					
Audits: re-abstracting					
Studies and analysis: developing analytics files					
Studies and analysis: analyzing data					
Studies and analysis: generating reports					

Section II: Job Experience

Q8 Overall, how satisfied are you with the cancer registry profession?

- Extremely satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Extremely dissatisfied

Q9 How long have you worked in the cancer registry profession?

- 1–5 years
- 6–10 years
- 11–15 years
- 16–20 year
- more than 20 years

Q10 I am answering this hospital survey for my primary employer as a
 hospital registry employee
 contracted hospital registry employee

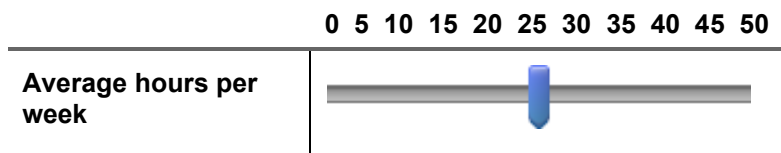
Q11 Are you a Certified Tumor Registrar (CTR)?

- Yes
- No

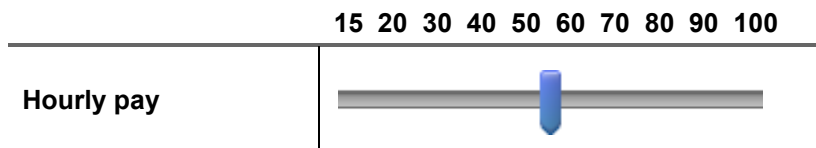
Q12 Please choose the option below that best describes your job title.

- Cancer registrar
- Abstractor
- Analyst
- Coordinator
- Supervisor
- Manager
- Director
- Consultant
- Other _____

Q14 Drag the slider to indicate your regular hours worked per week. If you work for more than one registry, please only answer for the registry managed by the person who forwarded this survey. If you work more than 50 hours, please select 50.



Q15 Please **estimate** your average **hourly** pay in US dollars. **Round to the nearest dollar.** If you are paid by *salary*, please enter your annual salary divided by annual hours worked. If you are paid by *abstract*, please estimate your *hourly earnings*. For hourly earnings greater than 100, please enter 100.



Q16 About how many hours does it take to produce a high-quality abstract for different types of cases in terms of complexity? For a range such as 2–3 hours, please enter the midpoint, 2.5.

Simpler cases _____

More complex cases _____

Q17 Do you feel you have enough time to prepare high-quality abstracts?

Rarely

About half the time

Most of the time

Section III: Time Estimates – Daily, Weekly, Monthly, Annually

Q18 In this question, we ask you to **estimate** the time you **typically** spend on various activities in your current position **over a 12-month period**. The daily amounts do *not* need to be the same as your answers in the activity log (Question 7).

Please use the columns below to estimate the number of hours you regularly spend per day, week, month, or annually on the following activities. This list is not meant to be inclusive of all possible work activities.

Choose the best column for each activity. If you do one activity most days, choose daily, if you do another activity once or twice a week, estimate the total hours for the week and use the weekly column. For less frequent activities, use the monthly or yearly column. For activities that you do not do, use the N/A column and enter zero or leave blank.

Please round to the nearest half hour.

Example 1: For 2 hours and 10 minutes, enter “2.”

Example 2: Abstracting, 3 and a half hours per day: enter “3.5” in the **daily** column.

Example 3: Follow-up, 4 hours, two times per week: enter “8” in the **weekly** column.

Example 4: Reabstracting, 20 hours per month: enter “20” in the **monthly** column.

	Daily	Weekly	Monthly	Yearly	N/A - 0
Case finding					
Abstracting					
Follow-up					
Quality: visual edits of abstracts					
Quality: consolidating records – reconciling discrepancies					
Audits: case finding					
Audits: re-abstracting					
Studies and analysis: developing analytics files					
Studies and analysis: analyzing data					
Studies and analysis: generating reports					

Q19 Please estimate the number of hours spent each year completing, preparing for, or attending the following activities. For example, if you attend monthly 1-hour staff meetings, enter 12 hours per year. If you are not sure, use your best estimate.

	Annual hours
Cancer committee	
Cancer conference/tumor board	
Staff meetings	
Research	
Working with community groups	
Database management	
Training/development, including travel time	
For CoC-approved facilities, time spent on activities related to CoC survey	

Section IV: COVID-19 Supplement

Q20 Were you working as a registrar during the pandemic?

- Yes, the entire time, at my current employer
- Yes, the entire time, and have changed employers
- Part of the time
- No

Skip to end of block if "Were you working as a registrar during the pandemic?" = No.

Q21 Have you worked for the same employer since the start of the pandemic

- Yes
- No

Q22 Prior to the pandemic and shutdown in March of 2020, did you work on-site, remotely, or a mix of locations (hybrid model)?

- I worked primarily on-site.
- I worked primarily from a remote location (at home or other place)
- I worked both on-site and remotely (hybrid model)
- Not applicable
- Other _____

Q23 Did you change your primary work location during the pandemic?

- Yes, I changed from on-site to remote.
- Yes, I changed from remote to on-site
- Yes, I changed to a hybrid model.
- Yes, I remained on-site but was assigned to a different area.
- No, I did not change my work location.
- Other _____

Skip to Q25 if "Did you change your primary work location during the pandemic?" = No, I did not change my work location.

Q24 Do you currently work on-site, remotely, or a mix of the two (hybrid)?

- Fully on-site
- Fully remote
- Hybrid
- Other _____

Q25 The time you spent on your regular duties at the outset of the pandemic

- decreased.
- stayed about the same.
- increased.

- Q26 If your workload shifted, to what other types of tasks were you assigned?
- My workload did not change
 - COVID-19 case tracking
 - Administrative tasks
 - Nonregistry duties
 - Working directly with patients
 - Other _____
- Q27 Did your facility provide additional training and equipment necessary to perform your regular work during the pandemic?
- Yes, both training and equipment
 - Yes, training only
 - Yes, equipment only
 - No, neither training nor equipment
 - N/A or not needed during pandemic
- Q28 Did/Do you feel that your safety was/is jeopardized by your work assignment during the pandemic?
- Very much
 - Somewhat
 - Not jeopardized
- Q29 Were you satisfied with the support you received in order to do your regular registrar duties during the pandemic?
- Extremely dissatisfied
 - Somewhat dissatisfied
 - Neither satisfied nor dissatisfied
 - Somewhat satisfied
 - Extremely satisfied
- Q30 In what ways did your personal responsibilities change due to the pandemic? (Check all that apply.)
- Increased childcare responsibilities during work hours
 - Caretaking for older relatives
 - Caretaking for sick family members
 - Increased expenses due to working from home
 - None
 - Other _____
- Q31 Did your registry provide you with flexibility around changes in your homelife responsibilities during the pandemic, if any?
- Yes
 - No
 - Somewhat _____

Q32 How did your stress level change due to your workload during the pandemic?

- High/burnout level of stress
- Moderate level of stress
- Stayed the same, no change
- Somewhat lower stress level
- Greatly lower stress level

Section V: Stress and Burnout Supplement

Q33 Do you feel that your current workplace is a safe place to work?

- Very safe
- Somewhat safe
- Not safe
- N/A – I work remotely.

Q34 What is your current stress level due to your workload?

- None at all
- A little
- A moderate amount
- A lot
- A great deal

Q35 What is your current stress level due to your work climate?

- None at all
- A little
- A moderate amount
- A lot
- A great deal

Q36 Overall, based on your definition of burnout, how would you rate your level of burnout?

- I enjoy my work. I have no symptoms of burnout.
- Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out.
- I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.
- The symptoms of burnout that I'm experiencing won't go away. I think about frustration at work a lot.
- I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help.

Q37 Are you planning to leave the profession (or retire) within the next 5 years

- Yes, I am retiring in the next 5 years.
- Yes, I plan to leave the profession in the next 5 years (not due to retirement).
- No, I do not plan to leave the profession in the next 5 years.
- I am unsure about leaving/retiring in the next 5 years.

Q38 Is there anything else that you would like us to know that we did not ask, or that you want to clarify in your answers?

Appendix E. Study Challenges in Methodology and Data Collection

Several challenges were encountered in this study:

- **Lead registrar designation in the NCRA database was not always accurate.** Some recipients of the RLS responded to the UCSF team to say that they were not the correct person to fill out the RLS nor to distribute the CRS to staff. In many cases, this was due to the registrar moving on to a new role or retiring. Several of these registrars were able to forward the survey to the correct person.
- **The lead registrar designation was sometimes applied to multiple registrars within the same registry.** In these cases, the NCRA team reached out to all those who were listed as the lead to clarify the correct person to complete the RLS and distribute the CRS.
- **There was a low RLS response rate.** The RLS was sent to approximately 1,000 lead registrars representing about 800 registries, and there were about 237 complete responses.
- **There was a low CRS response rate.** Registry leads were asked to what number of registrars they would be sending the CRS. The response rates for each registry were calculated; the mean was about 50%, meaning that of the invited registrars, only approximately half participated in the survey.
- **Many lead registrars did not send the CRS to their noncontract registry staff.** Several lead registrars responded to the UCSF team to say they did not feel comfortable sending the CRS to their registry staff because the study originated from NCRA rather than the CoC.
- **There were low registry counts for matched analyses.** A total of 291 CRS responses matched with RLS responses among 85 unique registries. However, the 85 registries did not provide high enough counts for a meaningful analysis of the matched results.
- **Contract staff did not respond to the CRS at proportionate rates.** Based on information provided by lead registrars in the RLS and anecdotal evidence provided during the postsurvey interviews, the research team understands that contract staff employment is becoming increasingly prevalent. However, very few contract staff completed the CRS. This could be because registry leads did not send the CRS to contract staff.
- **The voluntary nature of participation may underrepresent some groups.** For example, most respondents to the CRS reported being satisfied with the profession. Less satisfied registrars, however, may not have been willing to respond to the survey.

Appendix F. Postsurvey Interview Guides

F1. National and Federal Partner Interview Guide

Introduction

Please provide a brief introduction of yourself. Include your name, title, organization that you work for, and the number of years you have spent in that title and at your organization.

Next, we'd like to discuss several key findings from our survey data and get your perspective on what these findings mean for the future of the cancer registry workforce.

Key Finding #1: Completion Time for Abstracts

Data from our hospital survey (answered by registry managers/leads) indicate that registrars take about 1 hour to complete an abstract for a simple case and about 1.5 hours to complete an abstract for a more complex case. Data from our activity log (answered by registrars) indicate that registrars take about 1 hour to complete an abstract for a simple case and about 2.5 hours to complete an abstract for a more complex case.

1. Are these findings surprising to you?
2. Do these findings seem accurate to you?
3. How do you think these time estimates might change with new technology?

Key Finding #2: Staffing and Vacancies

About one quarter of registries reported they have vacant positions and expressed concern about filling them.

4. Do you have any thoughts on why so many registries have vacant positions?
5. What does the industry need to do to attract people to this workforce?

The purpose of our study is to create a staffing model to predict how many workers are needed.

6. How would managers use a staffing model to advocate for the staffing they need?

Key Finding #3: Contract Staff

Many registries reported employing contract or temporary staff.

7. Are you familiar with the process for hiring contract staff instead of or in addition to permanent (i.e., noncontract) workers?
8. What are the benefits and challenges to employing contract staff?

Key Finding #4: Training and Skills

Registry managers/leads reported that about half of their staff needed ongoing training or continuing education in the following areas: program changes and updates; data analysis and informatics; and coding, classifying, and reporting cases.

9. Do you agree that these are the areas in which most ongoing training or continuing education is needed?
10. Are there other areas of ongoing training or continuing education that you feel are important to the registrar profession that are not captured in this list?

Key Finding #5: Burnout, Turnover, and Retention

On both surveys, we asked several questions about burnout, satisfaction, and plans to stay in the industry. The vast majority said they were satisfied with the profession, but about 20% of respondents generally experienced moderate to extreme burnout. Less than 70% of registrars said they planned to still be in the profession in 5 years' time (some due to retirement). About one third of registrars expressed significant increases in stress levels due to the pandemic.

11. In your opinion, what does the industry need to do to address burnout, turnover, and retention?

General Questions

12. What direction(s) do you see registries going in the future?
 - a. Do you anticipate an increased use of automation?
 - b. Which technical advancements are underway?
 - c. Do you think there will be more focus on quality data initiatives and outcomes?
13. What innovations, related to workload, are cancer registries pursuing now versus innovations pursued in the past?

F2. Registrar Partner Interview Guide

Introduction

Please provide a brief introduction of yourself. Include your name, title, organization that you work for, and the number of years you have spent in that title and at your organization.

Next, we'd like to discuss several key findings from our survey data and get your perspective on what these findings mean for the future of the cancer registry workforce.

Key Finding #1: Completion Time for Abstracts

Data from our hospital survey (answered by registry managers/leads) indicate that registrars take about 1 hour to complete an abstract for a simple case and about 1.5 hours to complete an abstract for a more complex case. Data from our activity log (answered by registrars) indicate that registrars take about 1 hour to complete an abstract for a simple case and about 2.5 hours to complete an abstract for a more complex case.

1. Are these findings surprising to you?
2. Do these findings seem accurate to you?
 - a. Do you have any thoughts about the discrepancy for the reported time to complete complex abstracts between registry managers/leads and registrars?
3. How do you think these time estimates might change with new technology?

Key Finding #2: Staffing and Vacancies

About one quarter of registries reported they have vacant positions and expressed concern about filling them.

4. Do you have any thoughts on why so many registries have vacant positions?
5. What does the industry need to do to fill vacant positions?

The purpose of our study is to create a staffing model to predict how many workers are needed.

6. What is your staffing model?
 - a. How do you create a staffing model for your registry?

- b. How do you advocate for the positions that you need? (*Probe: What kind of data are you expected to show and to whom?*)

Key Finding #3: Contract Staff

It is our understanding that many registries rely on contract staff. However, most of our respondents reported not using contract staff. This seemed to contradict our expectations based on preliminary findings.

7. Do you have contract staff at your registry?
 - a. How many?
 - b. Why?
 - c. How do you find or recruit them?
8. How do contract staff work differently than permanent (i.e., noncontract) staff?
9. In the future, do you plan to hire more contract staff?
 - a. Why or why not?

Key Finding #4: Training and Skills

Registry managers/leads reported that about half of their staff needed ongoing training or continuing education in the following areas: program changes and updates; data analysis and informatics; and coding, classifying, and reporting cases.

10. Do you agree that these are the areas in which most ongoing training or continuing education is needed?
11. Are there other areas of ongoing training or continuing education that you feel are important to the registrar profession that are not captured in this list?

Key Finding #5: Burnout, Turnover, and Retention

On both surveys, we asked several questions about burnout, satisfaction, and plans to stay in the industry. The vast majority said they were satisfied with the profession, but about 20% of respondents generally experienced moderate to extreme burnout. Less than 70% of registrars said they planned to still be in the profession in 5 years' time (some due to retirement). About one third of registrars expressed significant increases in stress levels due to the pandemic.

12. In your opinion, what does the industry need to do to address burnout, turnover, and retention?

General Questions

13. What direction(s) do you see registries going in the future?
 - a. Do you anticipate an increased use of automation?
 - b. Which technical advancements are underway?
 - c. Do you think there will be more focus on quality data initiatives and outcomes?
14. COVID-19 had a huge impact on the workplace and the work setting. Do you feel that
 - a. the industry has recovered from backlogged cases?
 - b. the shift to working from home more often is permanent?

F3. Contract Work Expert Interview Guide

1. Please provide a brief introduction. Include your name, title, organization, and the number of years in that title at the organization.
2. How frequently are contract workers used in the industry?
3. Can you describe the recruitment and hiring process for contract workers?

4. How are contract workers supervised, and by whom?
5. How are contract workers compensated?
 - a. What is your average hourly rate, salary, and/or rate paid by case?
 - b. What kinds of benefits do contract workers receive?
6. How long do contract workers typically stay in these roles?
7. How does having a contracted workforce benefit registries?
8. Do you have any insight into satisfaction levels for contract workers versus workers who work for a registry?
9. Why do registrars make the switch from working at a registry to contract work?

F4. Software Vendor Interview Guide

1. Tell us about your software company (e.g., how many products you have that are used by registrars, what the programs are used for, etc.)
2. How does your software impact the work and workload of the registrars?
3. Are registrars involved in the development and improvement process of the software?
4. Where are you going in the future with the software related to registry functions?

Appendix G. Additional Survey Data

This appendix provides response data to questions not included in the main body of the report. It also offers greater detail for some questions that are included in the main body of the report. The data is organized by survey—RLS or CRS—and question number. The wording of the question is also shown. For all survey questions for the RLS and CRS, please see Appendices C and D, respectively. In the following tables, answer choices have been consolidated where there are fewer than 5 responses.

Registry Lead Survey (RLS)

Q13: What is the department of the person to whom you directly report?

Department	<i>n</i>	%
Cancer Program	39	16.6
Health Information Management/Medical Records	34	14.5
Hospital/Facility Administration	29	12.3
Oncology Service Line Director	74	31.5
Other	36	15.3
Quality	23	9.8
Total	235	100.0

Q20: Which of the following years are more than 95% completed? (*N* = 229)

Years more than 95% completed	<i>n</i>	%
All 4 years: 2019–2022	32	14.0
3 years: 2019–2021	132	57.6
2 years: 2019–2020	16	7.0

Q37: What percentage of your staff needs ongoing training or continuing education on the following topics? Do not include initial CTR training, and only include staff that needs the type of training for their position.

Area of concern	Mean %	Median %	Min	Max	<i>n</i>
Software training	34.3	20	0	100	104
Data analysis/informatics	47.2	47	0	100	134
Program changes and updates	52.9	50	0	100	153
Coding, classifying, and reporting cases	46.1	41	0	100	148

Q40: Other than regular cancer registry duties, how often are your cancer registrars called upon to do work that supports the functions of noncancer departments?

Response	<i>n</i>	%
Daily	11	5.2
Weekly	25	11.8
Monthly	23	10.8
Less than once per month	47	22.2
Never	106	50.0
Total	212	100.0

Q41: To what degree did the COVID-19 pandemic shift the workload of your cancer registrars to support necessary functions of other departments (e.g., Emergency Department functions or other nonregular registrar duties)?

Response	<i>n</i>	%
None	152	71.0
A little	40	18.7
A moderate amount	10	4.7
A great amount	12	5.6
Total	214	100.0

Cancer Registrar Survey (CRS)

Q9: How long have you worked in the cancer registry profession?

Years in profession	<i>n</i>	%
1–5 years	79	27.6
6–10 years	62	21.7
11–15 years	41	14.3
16–20 years	37	12.9
More than 20 years	67	23.4

Q12: Please choose the option below that best describes your job title.

Job title	<i>n</i>	%
Cancer registrar	178	62.5
Abstractor	42	14.7
Supervisor, Manager, Director	22	7.7
Coordinator	13	4.6
Analyst or Other	30	10.5
All	285	100.0

Used in Figure 10, the data in the following table show mean and median wages per hour by time in profession. These data combine response information from Question 9 and Question 15.

Years in Profession	<i>n</i>	Mean Wage, \$/hr	Median Wage, \$/hr
1–5	79	25.53	25.00
6–10	59	31.07	29.00
11–15	40	36.98	35.00
16–20	37	34.65	31.00
More than 20 years	66	36.95	34.00
All	281	32.21	31.00

Q16: About how many hours does it take to produce a high-quality abstract for different types of cases in terms of complexity? For a range such as 2–3 hours, please enter the midpoint, 2.5.

Type of case	Median, hr	Mean, hr	Standard deviation	<i>N</i>
Simpler cases	1.2	1.3	0.565	262
More complex cases	2.5	2.4	0.915	262