Using Multi-Source Data Integration to Identify Gaps in Clinical Trial Access Across Regional Research Sites

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SIDNEY KIMMEL COMPREHENSIVE CANCER CENTER RESEARCH CONSORTIUM

Background

- Clinical trial delivery and catchment service are core responsibilities of NCI-designated cancer centers, yet they are often evaluated separately.
- Clinical trials provide access to innovative treatments, but participation remains low (~7%), particularly among minoritized populations; travel burden is a key barrier.
- The Sidney Kimmel Comprehensive Cancer Center (SKCCC) at Jefferson operates 10 hospitals across four Regional Research Sites (RRSs), creating opportunities to expand clinical trial access across its 7-county catchment area.
- While catchment populations and trial accruals are routinely reported, spatial comparisons across residents, cancer patients, and trial participants are rarely used to identify access gaps and guide trial placement.

Goal

Use a spatial, catchment-informed approach to evaluate how well clinical trial participation aligns with population need, cancer patient distribution, and access barriers to identify opportunities to expand equitable trial access across SKCCC Regional Research Sites.

Methods

Observational analysis integrating three populations: catchment residents (census data, 2023), cancer patients (SKCCC tumor registry 2019-2023, n = 68,732), and clinical trial participants (SKCCC accrual data 2017-2026, n = 16,271).

Evaluated three domains:

- geographic distribution and cancer site prevalence
- drive-time access to SKCCC locations
- demographic and socioeconomic factors relevant to access and representation.

Spatial comparisons across the three populations were used to identify gaps and opportunities for expanding clinical trial access at Regional Research Sites.

Discussion

- Cancer patients and trial participants travel ~20 minutes for care, consistent with evidence that patients seek care close to home.
- Regional Research Sites reduce travel burden and expand geographic access to cancer care and clinical trials.
- Each RRS serves distinct local populations with different demographics, SDOH profiles, and cancer site patterns; some sites show strong accrual among women and racial/ethnic minority patients.
- Trial portfolios at RRSs remain narrow, highlighting opportunities to expand trials aligned with local cancer burden (e.g., prostate cancer).
- Future work will assess site capacity and resources to guide strategic trial expansion that improves geographic alignment and equitable participation.

How can we use Regional Research Sites (RRS) to strategically increase access to clinical trials?

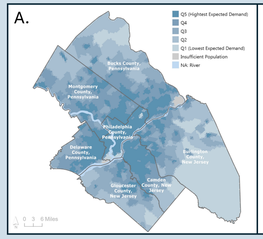
Cancer Sites

Catchment Residents

Estimated Demand for Cancer Care

A. Age-associated risk-weighted population density
B. Population-weighted catchment cancer rates

Key Insights: Expected demand radiates from Philadelphia. Cancer rates are higher than nation.



B.

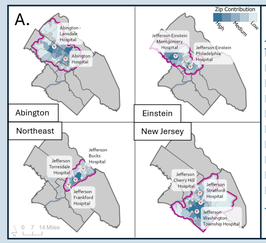
Site	USA	Catchment
All Cancer Sites Combined	448.6	**458.6**
Female Breast	131.3	**135.8**
Prostate	116.4	**130**
Lung and Bronchus	52.5	**55.6**
Colon and Rectum	36.7	**37.6**
Corpus and Uterus, NOS	27.9	**32.7**
Melanomas of the Skin	23.1	**16.7**
Urinary Bladder	18.8	**20.1**
Non-Hodgkin Lymphoma	18.5	18.4
Kidney and Renal Pelvis	17.5	16.5
Leukemias	14.3	12.4
Pancreas	13.7	**14.8**
Thyroid	12.9	**14**
Oral Cavity and Pharynx	12.1	10.9
Ovary	10	**10.8**
Liver and Intrahepatic Bile Duct	8.6	**9.1**
Cervix	7.5	**7**
Myeloma	7.2	**7.7**
Stomach	6.5	**7.1**
Brain and Other Nervous System	6.3	**6.4**

Cancer Patients

RRS Cancer Patients

A. RRS micro-catchment zip codes
B. Prevalence of cancers at RRSs

Key Insight: RRSs largely serve nearby populations and, except for prostate cancer, treat a greater proportion of high-burden cancer sites than the center city location.



B.

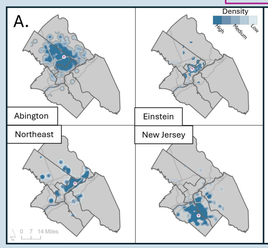
	Abington	Einstein	New Jersey	Northeast	Center City
All Cancer Sites	(n=16,192)	(n=10,581)	(n=12,288)	(n=6,761)	(n=20,453)
Female Breast	**3,498 (18.7%)**	**2,221 (20.3%)**	2,087 (17.0%)	1,044 (15.5%)	2,314 (11.3%)
Prostate	1,840 (10.2%)	1,049 (9.6%)	1,266 (10.3%)	692 (10.3%)	2,103 (10.3%)
Lung and Bronchus	**1,637 (9.0%)**	**1,265 (11.5%)**	**1,179 (9.6%)**	**1,079 (16.0%)**	1,733 (8.5%)
Colon and Rectum	**1,299 (7.1%)**	**851 (7.8%)**	**822 (6.7%)**	**532 (7.9%)**	1,040 (5.1%)
Corpus and Uterus, NOS	**1,155 (6.3%)**	**334 (3.0%)**	**346 (2.8%)**	**152 (2.3%)**	447 (2.2%)
Melanomas of the Skin	204 (1.5%)	24 (0.2%)	54 (0.8%)	64 (0.9%)	679 (3.3%)
Urinary Bladder	**625 (3.4%)**	353 (3.2%)	**583 (4.7%)**	**431 (6.4%)**	615 (3.0%)
Non-Hodgkin Lymphoma	1,460 (7.7%)	503 (4.6%)	771 (6.3%)	573 (8.5%)	1,872 (9.2%)
Kidney and Renal Pelvis	319 (1.8%)	**132 (1.2%)**	**430 (3.5%)**	**225 (3.3%)**	569 (2.8%)
Leukemias	133 (0.7%)	70 (0.6%)	144 (1.2%)	59 (0.9%)	379 (1.9%)
Pancreas	668 (3.3%)	288 (2.6%)	363 (3.0%)	222 (3.3%)	861 (4.2%)
Thyroid	254 (1.4%)	176 (1.6%)	270 (2.2%)	187 (2.8%)	584 (2.9%)
Oral Cavity and Pharynx	434 (2.4%)	150 (1.4%)	212 (1.7%)	115 (1.7%)	887 (4.3%)
Ovary	345 (1.9%)	87 (0.8%)	199 (1.6%)	37 (0.5%)	226 (1.1%)
Liver	189 (1.0%)	320 (2.9%)	138 (1.1%)	116 (1.7%)	449 (2.2%)
Cervix	**224 (1.2%)**	**151 (1.1%)**	**137 (1.1%)**	**48 (0.7%)**	124 (0.6%)
Myeloma	259 (1.4%)	136 (1.2%)	169 (1.4%)	93 (1.4%)	374 (1.8%)
Stomach	222 (1.2%)	157 (1.4%)	195 (0.9%)	87 (1.2%)	313 (1.5%)
Brain and Nervous System	872 (4.8%)	468 (4.3%)	686 (5.6%)	358 (5.3%)	1,435 (7.0%)

Clinical Trial Participants

RRS Trial Participants

A. Accruals density by RRS
B. Accruals profiles by RRS

Key Insight: RRSs show distinct cancer trial profiles despite similar Phase 2-3 interventional treatment/supportive portfolios; accruals are mostly local, with Northeast showing a wider pull.



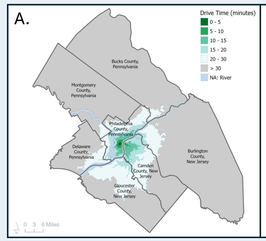
B.

Category	Abington (n = 474)	Einstein (n = 225)	Northeast (n = 83)	NJ (n = 281)
Report Description				
Ancillary or Correlative	20 (4.0%)	0 (0%)	0 (0%)	36 (14.8%)
Interventional	439 (88.0%)	211 (94.2%)	83 (100%)	187 (76.7%)
Observational	40 (8%)	13 (5.8%)	0 (0%)	20 (8.2%)
Study Type				
Basic Science	0 (0%)	4 (1.8%)	0 (0%)	0 (0%)
Diagnostic	1 (0.2%)	10 (4.4%)	0 (0%)	1 (0.4%)
Health Services Research	1 (0.2%)	0 (0%)	0 (0%)	20 (8.2%)
Other	24 (4.7%)	0 (0%)	0 (0%)	0 (0%)
Prevention	2 (0.4%)	0 (0%)	0 (0%)	0 (0%)
Screening	1 (0.2%)	1 (0.4%)	0 (0%)	1 (0.4%)
Supportive Care	190 (41.7%)	3 (2.7%)	83 (98.7%)	34 (16.5%)
Treatment	234 (50.4%)	17 (8.6%)	0 (0.6%)	70 (28%)
Trial Phase				
1	1 (0.2%)	0 (0%)	4 (4.9%)	2 (0.7%)
1/2	3 (1.1%)	0 (0%)	0 (0%)	0 (0%)
2	110 (23%)	40 (17.8%)	7 (8.4%)	27 (10.6%)
2/3	40 (8.5%)	0 (0%)	0 (0%)	0 (0%)
3	158 (33.5%)	0 (0%)	65 (78.3%)	53 (21.1%)
4	3 (0.6%)	0 (0%)	0 (0%)	0 (0%)
N/A	156 (32.9%)	181 (80.4%)	34 (41%)	205 (72.7%)
Cancer Site				
Bilateral	0 (0%)	145 (64.4%)	0 (0%)	0 (0%)
Breast	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Brain & CNS	0 (0%)	0 (0%)	0 (0%)	64 (22.8%)
Breast	119 (25.1%)	6 (2.7%)	35 (42.2%)	24 (8.5%)
Gyn. Phase	1 (0.2%)	0 (0%)	4 (4.9%)	1 (0.4%)
GI	39 (7.9%)	40 (17.8%)	2 (2.4%)	1 (0.4%)
Genitourinary	1 (0.2%)	0 (0%)	0 (0%)	0 (0%)
Gynecologic	160 (33.7%)	0 (0%)	0 (0%)	1 (0.4%)
Head & Neck	4 (0.1%)	0 (0%)	1 (1.2%)	0 (0%)
Hematologic	3 (1.1%)	0 (0%)	0 (0%)	0 (0%)
Lung	9 (1.9%)	1 (0.4%)	1 (0.4%)	41 (14.6%)
Melanoma	3 (0.6%)	0 (0%)	0 (0%)	0 (0%)

Drive-time Access to SKCCC

A. To Center City location only
B. To Regional Research Sites

Key Insights: RRSs increase 30-minute access from 60% to 96% of catchment residents, largely matching estimated demand.

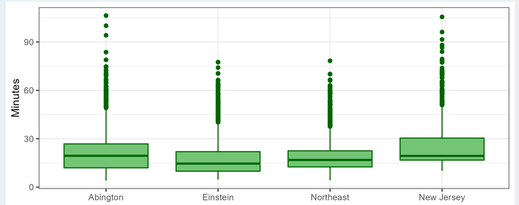


Travel Burden

Drive-time Analysis for Cancer Patients

A. Estimated cancer patient drive times to RRSs for care (based on zip code center)

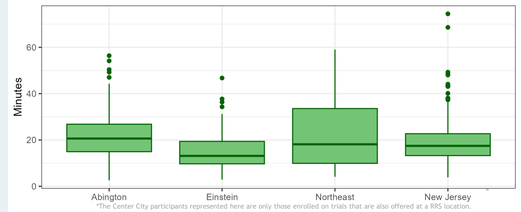
Key Insight: Most patients travel under 30 minutes to an RRS, with an average drive time of ~20 minutes.



Drive-time Analysis for Trial Participants

A. Trial participant drive-times to enrolling RRS (based on home address)

Key Insight: Clinical trial participants travel an average of 23 minutes to their enrolled site, with little variation across locations.



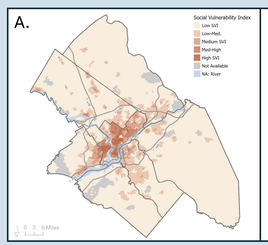
*The Center City participants represented here are only those enrolled on trials that are also offered at a RRS location.

SDOH Barriers

Social Drivers of Health

A. Geographic distribution of SVI
B. Population demographics & risk factors

Key Insights: Social vulnerability is concentrated in Philadelphia, with elevated behavioral and socioeconomic risk factors.



B.

Measure	USA	Catchment	Philadelphia
Total population	332,387,540	4,958,617	1,582,432
Female (%)	50.5	51.6	52.6
Non-Hispanic White (%)	58.2	57.4	33.6
Non-Hispanic Black (%)	12	20.9	38.9
Hispanic (any race) (%)	19	10.7	15.2
Non-Hispanic Asian (%)	5.7	6.5	7.7
Bachelor's Degree or Higher (%)	35	40.6	34.6
Below poverty (%)	12.4	12.5	**22.0**
With Disability (%)	13.1	13.6	**17.4**
Without Health Insurance (%)	8.6	5.3	**16.7**
Language Other Than English (%)	22	17.6	**23.9**
Foreign Born (%)	13.9	11.9	14.6
Age 65 and Older (%)	19.6	16.8	14.4
Poor or Fair Health (%)	18.2	18.5	**24.6**
Binge drinking among adults (%)	18.0	19.1	18.1
Sedentary behaviors among adults (%)	23.0	22.5	**27.0**
Obesity among adults(%)	33.4	32.8	34.5
Mammography use among women aged 50-74 years(%)	76.0	77.2	77.0
Current cigarette smoking among adults(%)	13.2	14.8	**18.1**
HPV Vaccination initiation (at least one dose) among teens ages 13-17(%)	78.2	Not Available	88.2

SDOH of RRS Patients

A. Area-level demographics & SDOH of RRS Micro-Catchment (top, middle) residents
B. Demographics of RRS cancer patients

Key Insight: RRS locations serve distinct populations compared to Center City and their surrounding micro-catchments, with differences in sex, race/ethnicity, education, language, and most notably, insurance status.

A. (Resident Population)

	Abington	Einstein	Northeast	New Jersey
	1,621,383	1,486,893	1,168,996	764,224
Sex				
Female (%)	51.5	51.9	51.3	51.1
Race/Ethnicity				
Asian (%)	8.4	7.9	5.1	8.6
Black (%)	18.5	28.1	14.4	14
Hispanic (%)	9.2	15.6	11.8	18.9
White (%)	59.7	44.1	64	53.7
Age Group				
Age 65 and Older (%)	18.5	16.2	17	16
Socioeconomic Factors				
Bachelor's Degree or Higher (%)	40.5	35.4	39	28
Below poverty (%)	10.4	17.4	8.7	16.4
With Disability (%)	12.9	16.2	12.9	16.4
Without Health Insurance (%)	18.7	20.4	25.8	39.4
Language Other Than English (%)	20	23.6	15.1	29.6
Foreign Born (%)	14.6	14.3	9.9	18.6

B. (Cancer Patients)

	Abington (n=18,573)	Einstein (n=10,600)	Northeast (n=12,371)	New Jersey (n=6,816)	Center City (n=20,372)
Sex					
Female (%)	**58.3**	**50.2**	**54.9**	50.6	49.3
Race/Ethnicity					
Asian (%)	3.9	4	2.1	3.7	6.5
Black (%)	14.1	**31.3**	14.7	11.3	24.3
Hispanic (%)	2.7	**7.4**	4.7	6.1	4.5
White (%)	**78.2**	33.2	**76.4**	**78.1**	62.9
Age Group					
Age 65 and Older (%)	54.5	41	40.2	58.9	50.4
Area-Level Socioeconomic Factors					
Bachelor's Degree or Higher (%)	**44.9**	31.6	36.7	28.4	40.6
Below poverty (%)	8.8	18.9	9.4	16.4	15.3
With Disability (%)	12.5	16.9	13.2	16.5	14.6
Without Health Insurance (%)	**24.8**	**33.8**	**38.2**	**52.6**	20.4
Language Other Than English (%)	18.4	23.6	14.6	**28.5**	20.3
Foreign Born (%)	13.8	14.2	9.5	17.7	13.6

Trial Participants by RRS

A. Demographics of trial participants
B. Area-level demographics & SDOH of trial patient census tracts

Key Insight: Einstein trials enroll more minority and older participants from high-poverty, high-disability, and linguistically diverse communities than Center City. Northeast draws from areas with higher uninsurance and foreign-born populations.

A. (Resident Population)

	Abington (N=474)	Einstein (N=225)	Northeast (N=83)	New Jersey (N=281)	Center City (N=15,208)
Sex					
Female	**383 (80.8%)**	83 (36.9%)	**61 (73.5%)**	**274 (97.5%)**	6780 (44.6%)
Race/Ethnicity					
Asian	10 (2.1%)	**14 (6.2%)**	1 (1.2%)	8 (2.8%)	824 (5.4%)
Black	54 (11.4%)	**124 (55.1%)**	12 (14.5%)	34 (12.1%)	4060 (26.8%)
Hispanic	15 (3.2%)	**17 (7.6%)**	4 (4.8%)	6 (2.1%)	635 (4.2%)
Other	8 (1.7%)	1 (0.4%)	1 (1.2%)	2 (0.7%)	62 (0.4%)
Unknown	7 (1.5%)	8 (3.6%)	0 (0%)	3 (1.1%)	182 (1.2%)
White	380 (80.2%)	61 (27.1%)	65 (78.3%)	228 (81.1%)	9425 (62.0%)
Age Group					
<50	66 (13.9%)	19 (8.4%)	8 (9.6%)	**48 (17.1%)**	1728 (11.4%)
50-64	174 (36.7%)	87 (38.7%)	**41 (49.4%)**	107 (38.1%)	6304 (41.5%)
65-74	164 (34.6%)	79 (35.1%)	24 (28.9%)	103 (36.7%)	5154 (33.9%)
75-84	64 (13.5%)	**37 (16.4%)**	10 (12.0%)	23 (8.2%)	1796 (11.8%)
>=85	6 (1.3%)	3 (1.3%)	0 (0%)	0 (0%)	146 (1.0%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	80 (0.5%)

B. (Trial Participants)

	Abington (N=474)	Einstein (N=225)	Northeast (N=83)	New Jersey (N=281)	Center City (N=15208)
Sex					
Female	**383 (80.8%)**	83 (36.9%)	**61 (73.5%)**	**274 (97.5%)**	6780 (44.6%)
Race/Ethnicity					
Asian	10 (2.1%)	**14 (6.2%)**	1 (1.2%)	8 (2.8%)	824 (5.4%)
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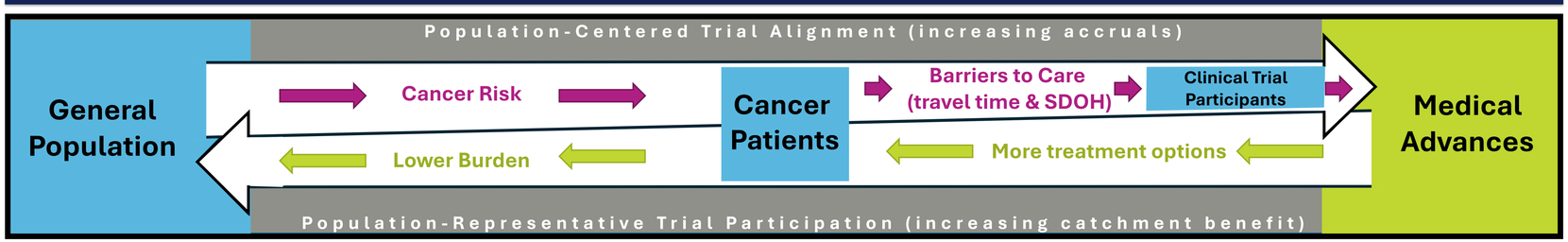
Conceptual Model