

Driven to Discover Research Facility at the Minnesota State Fair

2024 Annual Report

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“D2D is an amazing opportunity, and I am very grateful for this infrastructure and the ability to conduct studies at the state fair. This gave us an opportunity for an exciting new research direction and access to a population we would not have been able to reach otherwise. My research team is excited about participating in the future and expanding the size of our study.”

– 2024 D2D investigator



1367 COSGROVE
MINNESOTA STATE FAIRGROUNDS

“The environment was excellent for our study which had a unique design; it was a good way to recruit people with a wide variety of backgrounds beyond the standard college student sample.”

- 2024 D2D investigator

OUR STORY

Launching in 2014, the Driven to Discover Research Facility at the Minnesota State Fair – better known as D2D – links the substantial research capacity of the University of Minnesota with the largest public gathering in Minnesota. This innovative facility, the first of its kind in the nation, helps build a culture of research participation in Minnesota and accelerate learning on issues critical to the health and wellbeing of our citizens.



Serving as a forum for knowledge and ideas, D2D allows fairgoers to participate in research in an exciting, innovative, and convenient way. Most studies take under 20 minutes. With space for up to 50 researchers per day to recruit participants and collect data over the course of the fair, the D2D Research Facility allows researchers to meet enrollment goals in a matter of hours or days (as opposed to months or years), and provides a broader pool of participants than typically accessible.

Since 2014, the D2D program has reached over 490,000 fairgoers, one-quarter of whom hail from Greater Minnesota. To date, nearly 167,000 individuals have participated in 436 studies.

OUR MISSION

- Showcase UMN research
- Support fast, efficient recruitment with access to diverse participants
- Promote faculty & student engagement
- Provide opportunities for collaboration



OUR IMPACT



Connecting the Community with Research

- **Promote greater citizen participation in research:** D2D is showing that it is possible to “crowd source” research. An estimated 20% of Minnesotans attend the fair in a given year and thousands participate on-site in research at D2D, many of whom have no prior experience with research and few opportunities to become involved with in-person research. Through one-on-one interactions with University student and faculty investigators, citizens gain enthusiasm for scientific inquiry and gain awareness of the importance of research.

Accelerating Research Impact

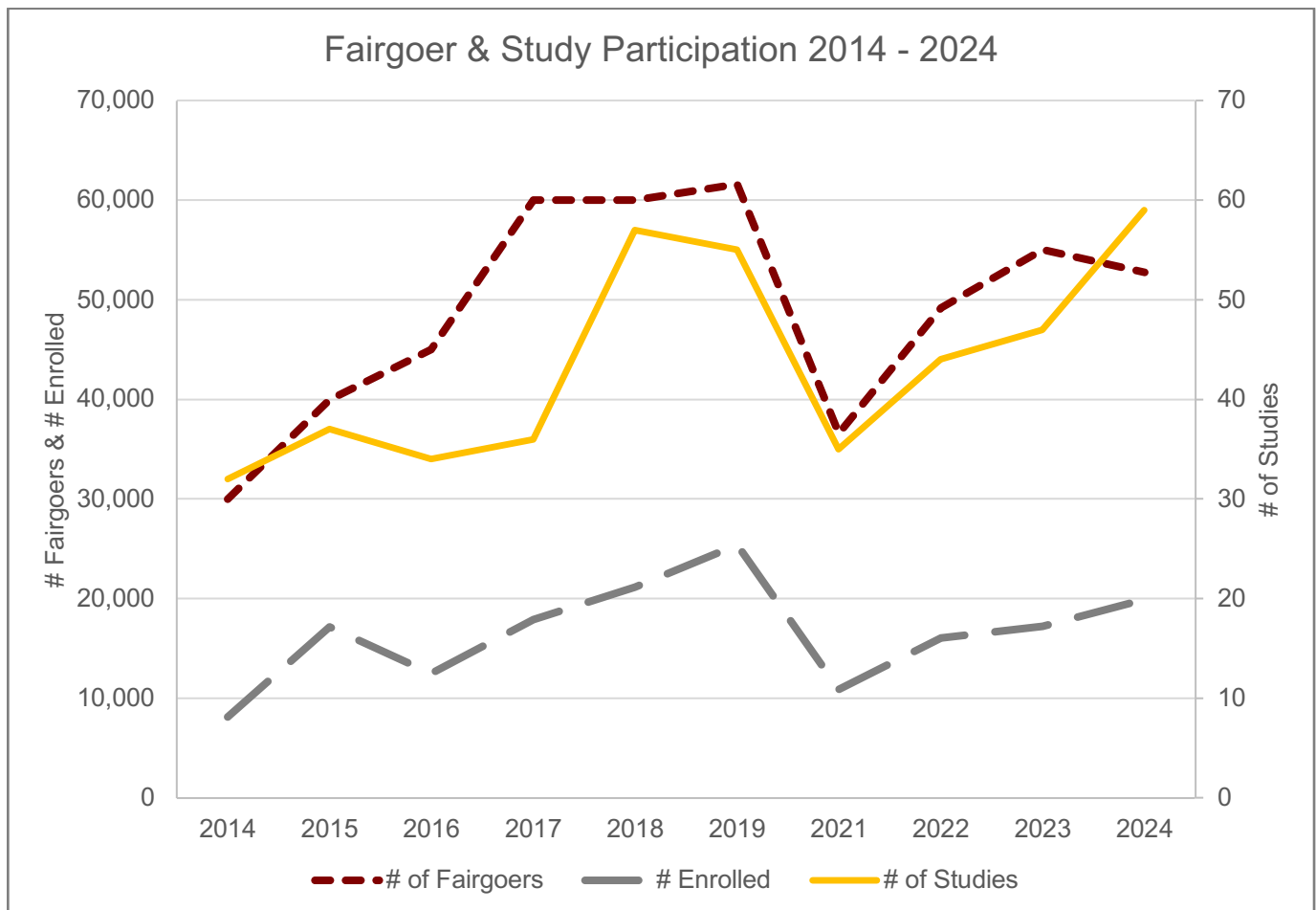
- **Rapid recruitment:** The rapid recruitment of research participants at D2D is far beyond what researchers can normally accomplish through traditional recruitment methods. Researchers using the D2D facility have reported it would have taken from 1-3 years to recruit the same number of participants.
- **Enable innovative studies and longitudinal tracking:** D2D’s State Fair setting provides endless possibilities for researchers to design and execute innovative studies, such as large-scale genomic collections. Many fairgoers return to the fair each year, enabling low-cost longitudinal follow-up not feasible in other venues.
- **Showcase University of Minnesota research:** D2D provides a public face for the University; building visibility for the wide scope of University research and providing Minnesotans the opportunity to interact with U of M researchers on an individual level. The program also provides researchers an easy way to communicate research results directly to the public.



Building Traffic & Enrollment, 2014 - 2024

TO DATE:

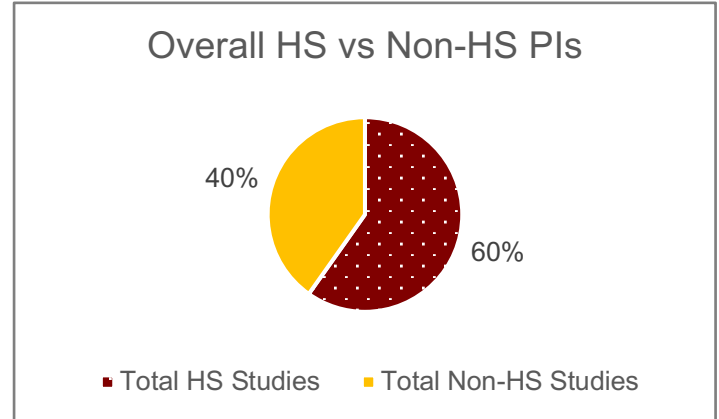
- FAIRGOER FOOT TRAFFIC - 490,140
- FAIRGOERS ENROLLED - 166,424
- 436 STUDIES
- 41 COLLEGE/SCHOOL/AGENCY PARTNERS
- 112 DEPT/DIVISION PARTNERS/UNIT



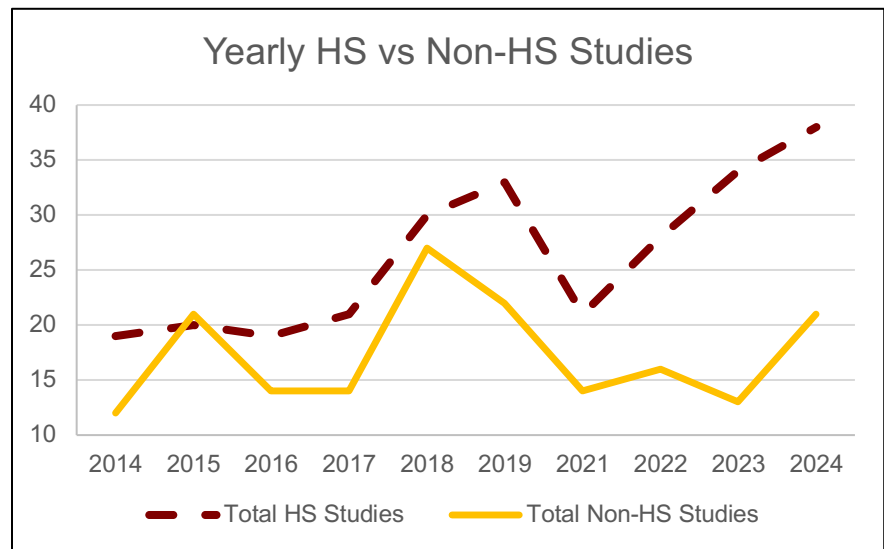
Health Science vs Non-HS Participation 2014 - 2024

WHAT DO THESE NUMBERS TELL US?

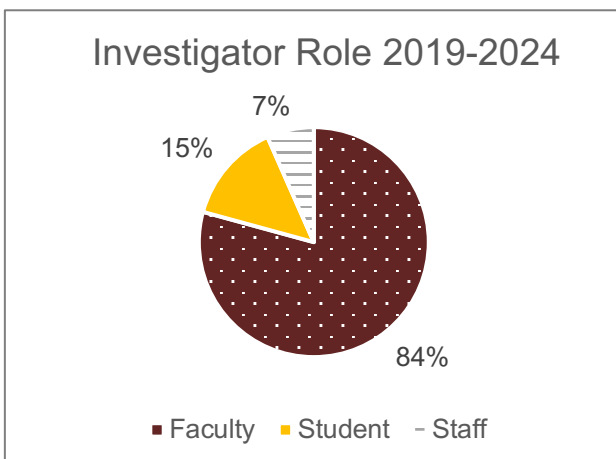
- Historically, fees have limited non-HS investigators as compared to HS investigators
- Post-pandemic, the split between HS & non-HS participation has grown
- Not only are HS investigators the majority of D2D's study line-up, they also have more funding to purchase more shifts during the Fair.



| D2D STUDIES | | | | |
|----------------|----|--------|-------|------------|
| | HS | Non-HS | Total | %-age HS |
| 2014 | 19 | 12 | 31 | 61% |
| 2015 | 20 | 21 | 41 | 49% |
| 2016 | 19 | 14 | 33 | 58% |
| 2017 | 21 | 14 | 35 | 60% |
| 2018 | 30 | 27 | 57 | 53% |
| 2019 | 33 | 22 | 55 | 60% |
| 2021 | 21 | 14 | 35 | 60% |
| 2022 | 28 | 16 | 44 | 64% |
| 2023 | 34 | 13 | 47 | 72% |
| 2024 | 38 | 21 | 59 | 64% |
| Average | | | | 60% |



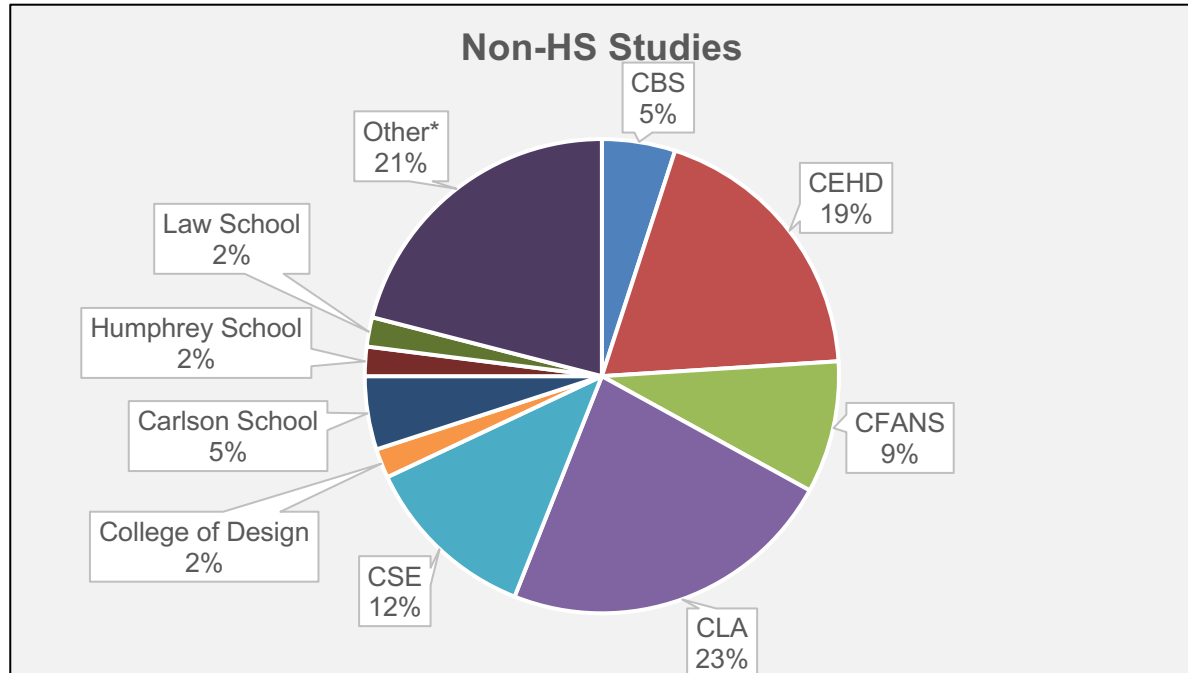
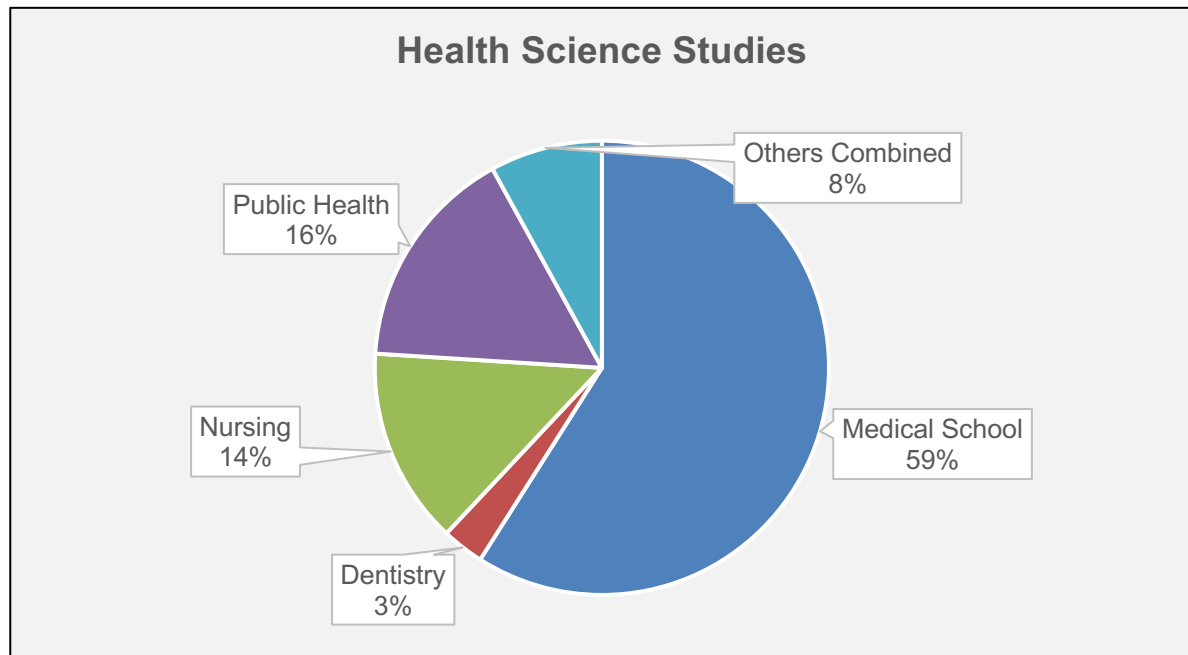
D2D WELCOMES STUDENT INVESTIGATORS



D2D is a great setting for students to gain hands-on research experience and collect data for projects and theses.



Health Science vs Non-HS Participation 2014 - 2024



* Crookston, Duluth, Rochester, HRPP, Libraries, External

WHAT DO THESE NUMBERS TELL US?

- Medical School is heaviest user
- D2D's reach is broad across Schools & Colleges outside the Health Sciences
- CLA & CEHD account for 42% of non-HS investigators

Health Sciences at D2D: STUDIES WITH PRINCIPAL INVESTIGATOR INSIDE HEALTH SCIENCES

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 | 2022 | 2023 | 2024 |
|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies |
| College of Pharmacy | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| College of Vet Med | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| Medical School | 13 | 16 | 11 | 10 | 15 | 20 | 13 | 17 | 17 | 22 |
| School of Dentistry | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 |
| School of Nursing | 2 | 2 | 0 | 3 | 5 | 4 | 4 | 6 | 6 | 5 |
| School of Public Health | 3 | 1 | 4 | 4 | 7 | 7 | 2 | 2 | 5 | 5 |
| Others Combined | 0 | 1 | 4 | 1 | 0 | 0 | 0 | 1 | 2 | 3 |
| Total Health Sciences | 19 | 20 | 19 | 21 | 31 | 33 | 21 | 30 | 33 | 38 |

Others include: CSH, FPDI, CTSI, MCC, Allied Health, RIO

Non-Health Sciences at D2D: STUDIES WITH PRINCIPAL INVESTIGATOR OUTSIDE HEALTH SCIENCES

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 | 2022 | 2023 | 2024 |
|-----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies | # of Studies |
| College of Biological Sciences | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| College of Edu & Human Dev't | 2 | 4 | 4 | 5 | 3 | 2 | 1 | 1 | 5 | 6 |
| College of Food, Ag & Natural Res | 2 | 4 | 1 | 1 | 2 | 4 | 0 | 1 | 0 | 0 |
| College of Liberal Arts | 4 | 8 | 4 | 2 | 5 | 4 | 1 | 4 | 3 | 5 |
| College of Science & Engineering | 0 | 1 | 1 | 2 | 5 | 5 | 2 | 3 | 1 | 1 |
| College of Design | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| Carlson School | 0 | 1 | 2 | 2 | 2 | 0 | 0 | 1 | 0 | 0 |
| Humphrey School | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| Law School | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Other* | 2 | 1 | 1 | 0 | 7 | 4 | 8 | 2 | 4 | 8 |
| Total Non-HS | 12 | 21 | 14 | 14 | 27 | 22 | 14 | 14 | 15 | 21 |

* - Crookston, Duluth, Rochester, HRPP, Libraries, External

2016 - 2024 Shift Revenue

| | | Health Sciences | | | Non-Health Sciences | | | Total Shifts | Total Revenue |
|------|--------------|-----------------|-------------|------------------|---------------------|-------------|-----------------|--------------|------------------|
| | | # of Shifts | Shift Type | \$ | # of Shifts | Shift Type | \$ | # | \$ |
| 2016 | RO | 14 | 16% | \$3,500 | 8 | 12% | \$2,000 | 22 | \$5,500 |
| | OS | 72 | 84% | \$58,032 | 58 | 88% | \$46,748 | 130 | \$104,780 |
| | Total | 86 | 100% | \$61,532 | 66 | 100% | \$48,748 | 152 | \$110,280 |
| 2017 | RO | 22 | 24% | \$5,500 | 20 | 28% | \$5,000 | 42 | \$10,500 |
| | OS | 69 | 76% | \$55,614 | 51 | 72% | \$41,106 | 120 | \$96,720 |
| | Total | 91 | 100% | \$61,114 | 71 | 100% | \$46,106 | 162 | \$107,220 |
| 2018 | RO | 37 | 31% | \$9,250 | 5 | 6% | \$1,250 | 42 | \$10,500 |
| | OS | 83 | 69% | \$66,898 | 77 | 94% | \$62,062 | 160 | \$128,960 |
| | Total | 120 | 100% | \$76,148 | 82 | 100% | \$63,312 | 202 | \$139,460 |
| 2019 | RO | 33 | 24% | \$14,850 | 0 | 0% | \$0 | 33 | \$14,850 |
| | OS | 105 | 76% | \$91,035 | 69 | 100% | \$59,823 | 174 | \$150,858 |
| | Total | 138 | 100% | \$105,885 | 69 | 100% | \$59,823 | 207 | \$165,708 |
| 2021 | RO | 12 | 15% | \$5,400 | 4 | 13% | \$2,180 | 16 | \$7,580 |
| | OS | 70 | 85% | \$60,690 | 26 | 87% | \$27,372 | 96 | \$88,062 |
| | Total | 82 | 100% | \$66,090 | 30 | 100% | \$29,552 | 112 | \$95,642 |
| 2022 | OS | 113 | 95% | \$91,902 | 33 | 100% | \$28,611 | 145 | \$120,513 |
| | Ext | 6 | 5% | \$8,100 | 0 | 0% | \$0 | 6 | \$8,100 |
| | Total | 119 | 100% | \$100,002 | 33 | 100% | \$28,611 | 151 | \$128,613 |
| 2023 | OS | 117 | 98% | \$101,439 | 38 | 100% | \$32,946 | 155 | \$134,385 |
| | Ext | 2 | 2% | \$2,700 | 0 | 0% | \$0 | 2 | \$2,700 |
| | Total | 119 | 100% | \$103,173 | 38 | 100% | \$32,946 | 157 | \$137,085 |
| 2024 | OS | 134 | 99% | \$93,800 | 64 | 96% | \$44,800 | 203 | \$138,600 |
| | Ext | 2 | 1% | \$2700 | 3 | 4% | \$4050 | 5 | \$6750 |
| | Total | 136 | 100% | \$96,500 | 67 | 100% | \$48,850 | 203 | \$145,350 |

2024 D2D Fee Structure: OS = \$700/shift; Ext = \$1350/shift

2024 Recap

- Visitors = 52,741
- Subjects enrolled = 19,946
- Studies = 59
 - 50 on-site data collection
 - 9 recruitment or community engagement
- PI Satisfaction = 96.4% Very Satisfied or Satisfied

On average:

- Subjects per shift, per study = 126 (range 14 - 379)
 - Adult studies = 142 (17 - 379)
 - Child studies = 51 (14 - 112)
- Shifts per study = 3 (range: 1-21, mode: 4)
- Cost per enrollee: \$11.45 (\$1.59 - \$42.42)

D2D Calendar

- Fall: RFA release, billing, feedback, reporting, promotions, fundraising
 - Winter: Application review & selection
 - Spring: Kick Off Meeting, shift scheduling, staffing, IRB submissions
 - Summer: Open houses, resource procurement, building set up, Fair!
-

August 21 - Sept. 1, 2025

See you at the Fair!



D2D is one of the gems of the University. Not only does it support the U's research endeavor, it provides an opportunity for the people of Minnesota to reach out and touch the University in a unique way. The people-to-people aspect of the building serves to humanize the University's research as well as the institution itself.

– D2D participant

Known D2D Research Publications 2024

PEER-REVIEWED PUBLICATIONS

2024

1. Boyer, E., Huang, Q., Ngwesse, S., Nelson, J., Oh, J. & Konczak, J., (2024). Ankle proprioception in children with cerebral palsy. *Journal of Pediatric Rehabilitation Medicine*, 17(1). 75-83. <https://doi.org/10.3233/PRM-220140>
2. Carpentier, S., Deng, W., Blackwood, J., & Van de Winckel, A. (2024). Rasch validation of the revised body awareness rating questionnaire (BARQ-R) in adults with and without musculoskeletal pain. *BMC musculoskeletal disorders*, 25(1), 799. <https://doi.org/10.1186/s12891-024-07893-1>
3. Ebert, K., Pham, G., Levi, S. & Eisenreich, B. (2024). Measuring children's sustained selective attention and working memory: validity of new minimally linguistic tasks. *Behavior Research Methods*, 56, 709–722. <https://doi.org/10.3758/s13428-023-02078-5>
4. Fride, N., Nachbor, K., Nelson, A., Snook, K., Shaker, R., Mavrommatis, S., Seaver, C., ... Retzlaff, A. (2024). Assessing sarcoma awareness among the general population in Minnesota: a cross-sectional survey study from the Minnesota State Fair in 2015 and 2022. *Journal of Cancer Education*, <https://doi.org/10.1007/s13187-024-02485-y>
5. Maravelas, R., Linneman, Z., Marmet, J., Hendrickson, M., Lunos, S., Hause, E., Quade, A.,... Pitt. M. (2024). Children's Understanding of Commonly Used Medical Terminology. *Pediatrics*.
6. Philbrick, A., Carlin, C., Harris, I., & Fallert, C. (2024). Using 15-minute serial blood pressures as an alternative to measuring a single blood pressure. *Innovations in Pharmacy*. <https://doi.org/10.24926/iip.v14i4.5565>
7. Rajagopal, A., Hendrickson, M., Pitt, M., Kelly, M., Lunos, S., Marmet, S. ,, Marmet, J. (2024). Lost in Translation: Teenagers' Understanding of Common Medical Jargon. *Hospital Pediatrics*.
8. Rajamani S, Austin R, Richwine C, Britt-Lalich M, Thakur M, Odowa Y, Jantraporn R, Marquard J. (2024). Understanding patient portal uses and needs: Cross-sectional study in a state fair setting. *JMIR Form Res* 2024;8:e64085. DOI: 10.2196/64085
9. Ricke, I., Spaulding, A., Rajtar, N., Benton, E., Anderson, I., Lundberg, L., Mussiel, A, & Nguyen, R. (2024). Predictors of willingness to receive updated 2023-2024 COVID-19 booster vaccines among a convenience sample in Minnesota. *Vaccine*.
10. Weiler, L., Scafe, M., Keyzers, A., Spencer, R., Burningham, K., & Cavell, T. (2024). Parents' attitudes toward and experiences with seeking informal mentors for their children. *Children and Youth Services Review*. doi:10.1016/j.chilyouth.2024.107681
11. Wise, M., Schefter, A., Brill, J., Bharucha, K., Tessier, K., Terrell, C., & Erickson, B. (2024). Public awareness and provider counseling regarding postmenopausal bleeding as a symptom of endometrial cancer. *Menopause*, 31(10), 905-910. doi: 10.1097/GME.0000000000002411
12. Ziccardi, S., Timanus, S., Ashrafzadehkian, G., Guy, S., & Hawe, R. (2024). Characterization of bilateral reaching development using augmented reality games. *Human Movement Science*, 96, <https://doi.org/10.1016/j.humov.2024.103254>.



Principal Investigator Affiliation, 2014-2024

| HEALTH SCIENCES COLLEGE/SCHOOL | DEPARTMENT/DIVISION |
|-----------------------------------|---|
| Center for Allied Health Programs | Program in Occupational Therapy |
| College of Veterinary Medicine | Veterinary Clinical Sciences Veterinary Population Medicine |
| College of Pharmacy | Experimental & Clinical Pharmacology Medicinal Chemistry Pharmaceutical Care & Health Systems Pharmacy Practice & Pharmaceutical Sciences |
| Medical School | Anesthesiology Center for Resuscitation Medicine Child & Adolescent Psychiatry Communicative Disorders Dermatology Developmental-Behavioral Pediatrics Duluth: Family Medicine & Biobehavioral Health Emergency Medicine Family Medicine & Community Health Laboratory Medicine & Pathology Medicine <ul style="list-style-type: none"> - Cardiology - Diabetes, Endocrinology & Metabolism - Gastroenterology, Hepatology & Nutrition - Hospital Medicine - Rheumatic & Autoimmune Diseases Microbiology & Immunology Neurology Neurosurgery Obstetrics, Gynecology & Women's Health <ul style="list-style-type: none"> - Gynecologic Oncology Ophthalmology & Visual Neurosciences Orthopedic Surgery Otolaryngology Pediatrics <ul style="list-style-type: none"> - Endocrinology - Epidemiology & Clinical Research - General Pediatrics & Adolescent Health - Hospital Medicine Pulmonology, Allergy, Critical Care & Sleep Med. Psychiatry & Behavioral Sciences <ul style="list-style-type: none"> - Child & Adolescent Mental Health Radiation Oncology Rehabilitation Medicine <ul style="list-style-type: none"> - Physical Therapy - Rehabilitation Medicine Surgery Urology |

| | |
|-------------------------------------|--|
| Office of Academic Clinical Affairs | Clinical Translational Science Institute Masonic Cancer Center |
| School of Dentistry | Primary Dental Care - Community Outreach & Engagement - Dental Hygiene |
| School of Nursing | Adult & Gerontological Health Cooperative Center for Spirituality & Healing Child & Family Health Cooperative Population & Health Systems Cooperative |
| School of Public Health | Environmental Health Sciences Epidemiology & Community Health Health Policy & Management |

| NON-HEALTH SCIENCES COLLEGE/SCHOOL | DEPARTMENT/DIVISION |
|---|---|
| Carlson School of Management | Applied Economics Behavioral Labs Marketing |
| College of Biological Sciences | Biochemistry, Molecular Biology & Biophysics Biotechnology Institute Ecology, Evolution & Behavior Genetics, Cell Biology & Development |
| College of Design | Design, Housing & Apparel |
| College of Education & Human Development | Educational Psychology Family Social Science Institute of Child Development Institute on Community Integration - TeleOutreach Center Institute for Translational Research in Children's Mental Health Kinesiology Social Work |
| College of Extension | Family, Health & Wellbeing |
| College of Food, Agricultural & Natural Resource Sciences | Animal Science Applied Economics Entomology Fisheries, Wildlife & Conservation Biology Food Science & Nutrition Soil, Water & Climate |
| College of Liberal Arts | Economics Geography, Urban, Environment & Sustainability Studies Hubbard School of Journalism & Mass Comm Political Science Psychology Speech-Language-Hearing Sciences |
| College of Science & Engineering | Biomedical Engineering Chemistry Computer Science & Engineering Mechanical Engineering |
| Food Protection & Defense Institute | Food Protection & Defense Institute |
| Human Research Protections Program | Community Oversight Board |
| Humphrey School of Public Affairs | Leadership & Management Science, Technology & Environmental Policy Transportation Studies Urban & Regional Planning |

| | |
|------------------------------|--|
| Law School | Law - Robina Institute of Criminal Law & Criminal Justice |
| University Libraries | Bio-Medical Library |
| Research & Innovation Office | Hormel Institute |

| UMN SYSTEM REPRESENTATION | COLLEGE/DEPARTMENT/DIVISION |
|----------------------------------|--|
| Crookston | Math, Science & Technology |
| Duluth | Communication Sciences & Disorders College of Education & Human Service Professions - Psychology College of Pharmacy - Pharmacy Practice & Pharmaceutical Sciences College of Science & Engineering - Mechanical & Industrial Engineering Foreign Languages & Literatures Geography, Urban, Environment & Sustainability Studies Medical School - Biobehavioral Health |
| Morris | Humanities - Communication, Media & Rhetoric Political Science Social Science |
| Rochester | Center for Learning Innovation |

| EXTERNAL RESEARCH PARTNERS | COLLEGE/DEPARTMENT/DIVISION |
|--|--|
| Boston Scientific | Peripheral Interventions |
| College of St. Benedict/St. John's University | Biology Exercise Science & Sport Studies |
| College of St. Scholastica | Physical Therapy |
| Concordia University | Department of Science Physical Therapy |
| Concordia University – Wisconsin | School of Education |
| Fairview Medical Group | Fairview Medical Group |
| Hamline University | School of Business |
| Hennepin County Medical Center | Laboratory Medicine & Pathology |
| Mayo Clinic | Cardiology Community Engagement in Research Program |
| Minneapolis Veterans Affairs Healthcare System | Center for Chronic Disease Outcomes Research |
| Minnesota Department of Health | Minnesota Department of Health |
| Minnesota State University – Mankato | College of Business - Management Communication Studies |
| National Institutes of Health | |
| Simmons University | School of Social Work |
| St. Catherine University | Political Science |