CISNET – Planning for the Future
Possible Future Priorities
Spring 2018
CISNET Goals for Future: Balancing Prior Formula for Success with New Opportunities

- Continue success of structure of multiple modeling groups each focused on single cancer sites using rigorous comparative modeling approach
  - Rapid response funds
  - Affiliate member program (join for collaborative opportunities, but no funding)
  - Junior investigators group (webinars and events at meetings)
  - Computer programmers interest group
  - Rigorous model documentation at different technical levels

- Enhance opportunities for:
  - Cross-cancer site collaborations
  - Training of junior investigators and their opportunities for funding
  - Outside investigators to work with CISNET
    - Modelers
    - Those wishing to work with CISNET on model applications
  - Constructive critique of CISNET models and modeling approaches
  - Setting standards for model sharing
  - Developing modeling for new cancer sites
  - Methods development
Possible Priority Areas for the Future

1) Precision Screening
   a. Risk-based screening — polygenic risk, family history, behavioral risk factors, etc.
      Who to screen and how often? Tradeoffs of optimal regimens vs. regimen complexity
   b. Subsequent screening regimen dependent on earlier events – e.g. prior screens, co-morbidities, etc.
   c. Impact of new technologies

2) Precision Treatment
   a. Big Data - taking advantage of availability of enhanced registry and other data between first course of therapy and death (detailed regimens, dose, recurrence), genomic characterization of disease
   b. Value/threshold pricing of expensive regimens
   c. Trial design and evaluation – e.g. impact of precision treatment de-escalation (non-inferiority trials)
   d. Population impact of advances (especially in recurrent setting)
3) **Overdiagnosis and Active Surveillance**
   a. Screening regimens to minimize the chance of overdiagnosis
   b. Decision to select active surveillance, regimens of active surveillance, decision to terminate active surveillance and initiate treatment

4) **Decision aids** – using models as engines to develop decision aids (policy and individual)

5) **Evidence-based implementation of screening and/or treatment processes** — understanding what works in real-world settings

6) **Meta-Synthesis** – model-based meta-analysis when trials are too different to combine under usual meta-analysis methods
7) State, local, and international cancer control planning

8) Suggesting optimal routes to reduce health disparities — race/ethnicity, income/education, insurance status, geography (e.g., rural/urban), access to health care

9) Methods Development
   a. Computing and algorithmic infrastructure development – high-speed computing and enhanced algorithms to solve problems such as high-dimensional model calibration and probabilistic sensitivity analysis
   b. Integration of statistical and simulation modeling – support of development of statistical modeling which will inform and/or can be inserted into simulation models (e.g. statistical modeling of recurrence)

10) Other cancer-specific opportunities
Possible Enhancement #1: Introduce New Cancer Sites

To Support:

- Development of “CISNET” type models for a new cancer sites not currently included in CISNET
- “Scaled down” version of full CISNET group
- Reduce the barriers to entry
- Would not provide a list of possible cancer sites
  - Modeling of issues related to cancer types other than those currently included—applicant would need to make the case that a cancer site is amenable to this type of modeling and that significant opportunities exist for model applications that would have impactful public health benefits

- Proposed cancer sites must meet the following criteria:
  - Cancer site must have existing, new, and/or evolving cancer control opportunities that are mature enough that they have been or could be shortly deployed
  - There are perceived inefficiencies in the way these cancer control strategies have been or might be deployed (which could be explored through modeling)
Possible Enhancement #1 (continued):
Introduce New Cancer Sites

- Multiple PI application from two (or possibly 2-3) modeling groups to maintain comparative modeling perspective
  - 2-3 modeling groups represents a scaled down version of the full CISNET sites, but still represents a big advantage over a single group
  - Designate a lead modeling group to acquire data sources, lead model comparisons, field inquiries
- Can include models developed from scratch or nascent efforts (unlike CISNET main award)
- Emphasis can include model development, extensions, and applications
  - Most models should include a natural history component (and show that data are available to support it) unless the applicant could indicate why it is not necessary
- More difficult to maintain independence of modeling efforts if they are developed from scratch (probably most models will be at least nascent efforts and will already have a basic structure formulated)
- Smaller budget than main CISNET site partly to lower financial barriers to entry for NCI (esp. given that most of these cancer sites have a smaller population “footprint”)
Possible Enhancement #1 (continued): Introduce New Cancer Sites

- Can possibly leverage current CISNET work (e.g. smoking history generator, HPV transmission models, co-morbidity adjusted lifetables)

- Measuring success for a new cancer site
  - Demonstrating that available evidence synthesized in simulation models can produce credible extrapolations
    - For example, models results can be validated against independent evidence not used in model development
  - Finding reasonable consistency between independently developed models
  - Developing opportunities across the cancer control spectrum where modeling can assist in optimizing choices that will have significant public health benefit
Possible Enhancement #2: Overall CISNET Coordination

As CISNET has grown in size and influence this seems necessary

- Enhanced training program for junior investigators (details to follow)
- Facilitating discussion & debates about modeling approaches, including forums for external critiques (participating in publications in this area)
  - As CISNET’s impact has grown, so has criticism (want to be welcoming of constructive critique)
- Facilitating cross-cancer site collaborations
- Integrating funded incubator cancer sites into CISNET community
- Outreach and fielding external inquiries
- Developing model release standards
- Continuing to develop model documentation standards, publication support, and members only website, and overall meeting support
Enhanced Junior Investigators Program (possible ideas)

- **Goal:** Support junior investigators (both pre and post doc) throughout CISNET to foster a career in decision modeling (both model development and model applications)

- As usual, work at one main site, but encourage visits to other sites
  - Develop catalog of short and medium term visiting opportunities at other sites

- Coordinated curriculum of webinars by senior members of CISNET to bring the breadth and richness of modeling approaches and applications

- Series of webinars by Junior Investigators, opportunities for junior investigators to discuss ongoing work, annual meeting for junior investigators

- Annual competitive small awards program to allow junior investigators to pursue independent ideas and possibly to support visits to other sites
Possible Enhancement #3: Competitive Supplements for CISNET Grants

To Support:

- Cross-cancer site collaborations in areas of common interest (e.g. overdiagnosis and active surveillance, risk-based screening, cancer recurrence modeling)
- Modeling cancer by genomic instead of anatomic characterization
- Opportunities for those outside CISNET to collaborate with CISNET
  - Those wishing to work with CISNET on specific model applications
  - Collaborate to enhance an existing model (e.g. improved modeling of DCIS for breast cancer)
  - Add a new model for existing cancer site (would need to provide strong scientific justification as to what this new model adds)
Possible Enhancement #3: Supplements to CISNET Grants (continued)

- Support modeling as extension of existing NCI consortia (e.g. Population-based Research to Optimize the Screening Process [PROSPR], Early Detection Research Network [EDRN])

- Opportunities for junior investigators (although the formal application would be through a coordinating center PI, a junior investigator could take a major role in much of the work)

- Model related methods development