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Looking into the distance:
Paving the way toward a
sustainable future

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EXECUTIVE SUMMARY

The COVID-19 pandemic has been highlighting the need for flexibility and innovation in simulation-based activities. The Healthcare Distance Simulation Collaboration formed in spring 2020 allowing for experts in this new and emerging field to bring together expertise around distance simulation. In August 2020, the first Healthcare Distance Simulation Summit was conducted identifying a distance simulation research agenda. Research teams were formed addressing areas of research identified during the first summit. In the fall of 2021, the 2nd Annual Healthcare Distance Simulation Summit brought global distance simulation experts together to discuss the status quo of distance simulation and identifying the next research agenda for distance simulation research. The main areas were faculty development, distance simulation pictography, and future research questions focused on the areas of need identified during the first summit. All groups formulated concrete steps to move the field of distance simulation forward. The 3rd Healthcare Distance Simulation Summit is planned for the fall of 2022.

SUMMIT OVERVIEW

BACKGROUND

The necessity of distance education methods at the onset of the COVID-19 pandemic was quick and wide-spread. Despite limited evidence and faculty resources, healthcare educators found ways to offer simulation-based experiences (SBE) online. This rapid evolution of online SBE encompassed a wide array of distance simulation modalities.¹ In response to this growth, four leading pediatric simulation societies (the International Network for Simulation-based Pediatric Innovation, Research, and Education [INSPIRE], the International Pediatric Simulation Society [IPSS], PediSTARS, and Netzwerk Kindersimulation [NKS]) determined that a collaborative gathering was necessary to generate consensus around these emerging training modalities.

In August 2020, the first-ever Healthcare Distance Simulation Summit was conducted. The purpose of the first summit was to develop a conceptual framework, unify around a common nomenclature, and determine future research directions for distance simulation. This virtual 3-hour event was attended by 156 people from 29 different countries and was offered in English and German. While the inaugural Healthcare Distance Simulation Summit was successful in bringing together the pediatric simulation community to achieve its aims, the planning team recognized an opportunity to be more intentional in diversifying specialty and disciplinary representation for future scientific meetings.

Findings of the first summit were used to determine a preliminary research agenda,² including the need for standardized nomenclature, pictography practices, and faculty development guidelines. A collaborative of healthcare simulation faculty was founded to address this urgent need for knowledge generation and quality standards around distance simulation methods for effective teaching and learning practices.³ This collaborative has since launched a number of projects:

A taxonomy group looked at definitions and terminology used in distance simulation. We found that the terms "virtual simulation", "remote simulation", and "telesimulation" are most used.⁴ Another team performed a scoping review of distance simulation in peer-reviewed and grey literature. We reviewed over 7000 articles that revealed a large variety of simulation techniques and terminologies. Our main findings were that overall, research quality in distance simulation research is low and most studies have a high risk of bias. We need high-quality, randomized controlled studies in distance simulation to advance the field.⁵

Since the first summit, the field of 'distance simulation' has continued to move rapidly. It is clear that methods of online SBE will be long-standing regardless of return to in-person didactic and practicum. An international survey of health professional educators on the state of distance healthcare simulation during the pandemic included 618 respondents from 32 countries. Our main finding was that 82% of respondents indicated long-term plans for continuing distance simulation.⁶ A pictogram development group explored ways to express the concept without words since consensus on terminology was seemingly difficult and article texts seemed more confusing to the methodology than the figures embedded.⁷ Lastly, we developed guidelines for distance simulation faculty development.³

In order to move the field of distance simulation forward, consensus about research priorities are a necessary next step. In the spring of 2021, the Healthcare Distance Simulation Collaborative team went to work, conceiving of a global scholars' consensus meeting for the 2nd Annual Healthcare Distance Simulation Summit.

APPROACH

Planning of the 2nd Annual Healthcare Distance Simulation Summit was undertaken using a low cost but highly generative format.⁸ The planning committee maintained a lean process through generous contribution of time by committed team members and passionate simulationists. The summit theme, mission and objectives were set (see below) and were used to guide the structure and agenda of the event. Essential consensus experts for achieving summit objectives were identified through iterative brainstorming rounds, and invitations were sent to the final list of 112 interprofessionally and internationally diverse experts in the fields of simulation and health professions education. Invitations were sent individually to each expert from the Healthcare Distance Simulation Collaborative Gmail account. Due to concern that invitations would be overlooked, disregarded, or lost to email filters, planning committee members with personal connection to each expert were copied on each invite. Follow-up 'personal touch emails' were sent by these team members from their professional accounts to encourage registration for the consensus summit. Invitees were informed of the authorship potential that would result from participation in the consensus summit. The event was scheduled on Saturday, October 23rd, 2021 mid-morning (Eastern Standard Time) to avoid work conflicts and promote attendance of international experts.

Invited experts who registered for the summit (n=92) were sent brief prework videos highlighting previous work of the Healthcare Distance Simulation Collaborative to inform and establish a shared mental model. To ensure an engaging and generative summit, experts were divided into five goal-orientated track sessions based on their expertise and for varied demographic representation. Each track aligned with a summit objective, including three tracks focused on establishing research priorities. These five tracks included:

1. Pictogram Track
2. Faculty Development Guidelines Track
3. Future Research: Safety & Acceptability Track
4. Future Research: Educational & Foundational Considerations Track
5. Future Research: Impact Track

Co-facilitators for each track were recruited by the planning committee and were provided guidance regarding their roles and expectations by the summit co-chairs. Track co-facilitators developed detailed plans for their sessions best-suited to meet track objectives. Track leaders also developed and distributed relevant track-specific resources to registered experts in advance of the event. The two-hour track sessions followed a 30-minute opening session, and were led in separate Zoom rooms. The event concluded with a 30-minute report-out by track leaders. A short debriefing with the planning committee and follow-up evaluation survey was sent to all participants to collect feedback about the scientific meeting and to determine interest in engaging in future work.

All conference sessions were video and audio-recorded to assist with data extraction. Summit attendees were informed about the potential use of recordings and registration or evaluation survey data for the generation of scholarly output and dissemination in peer-reviewed journals. All recordings and surveys are securely stored on password protected devices. By participating in the summit, participants granted consent for video/audio recording and dissemination of de-identified output of the meeting. Participants were informed of their option to opt out of this process and byline authorship to any contributed works generated as a direct result of their participation in the summit.

SUMMIT THEME, MISSION & OBJECTIVES

Theme	Looking into the distance: Paving the way toward a sustainable future
Mission	This 2nd Annual Summit will focus on developing a shared mental model, building on the previous year's work, and further exploring a distance simulation framework and best practices in distance simulation faculty development to date.
Objectives	<ol style="list-style-type: none"> 1. To aim for consensus in distance simulation conceptualization through universally understood visual illustration of distance simulation set-ups 2. To aim for consensus in healthcare distance simulation faculty development guidelines 3. To connect the global distance simulation community allowing for expansion and exploration of distance simulation-based research questions 4. To identify one or more project priorities that would be of most value to the healthcare distance simulation community

FINDINGS

The 2nd Annual Healthcare Distance Simulation Summit convened on Saturday, October 23rd, 2021. The meeting was attended by 82 experts from 16 countries (see below table) and 12 disciplines (Computer Science, Engineering, Human Factors, Organizational Behavior & Communication, Learning Design, Educator, Researcher, Emergency Medical Services, Nurse, Physician, Psychologist, Sociologist). Attendees of the summit were predominantly from the United States (n=56; 68%) and mostly physicians (n=40) and nurses (n=23).

Country	#
Bahrain	1
Canada	7
Denmark	1
Germany	2
India	2
Ireland	1
Mexico	1
New Zealand	2
Saudi Arabia	1
Scotland	1
Singapore	1
Sweden	1
Switzerland	2
United Kingdom	2
United States	56
China	1

A list of track attendees can be found under 'Byline Authors'. Findings of each track were summarized by track leaders during the report-out session.

Faculty Development Track

PhD student researchers in the MGH Institute of Health Professionals PhD Program drafted distance simulation faculty development guidelines with input from experts in instructional design, technologists, simulationists, and management. The students and the simulationists and technologist mentors of their work identified three areas that needed further expert discussion: 1. technology, 2. human factors, and 3. justice, equity, diversity, equity, and inclusion (JEDI), relevant to distance simulation approaches. Track co-facilitators divided experts into subgroups to facilitate discussion and achieve consensus using nominal group technique.

The **Technology Subgroup** discussed these questions:

- Is it best if distance simulation educators develop their knowledge in distance simulation technology or work directly with an instructional designer or technologist to create their distance sim?
- What is the degree of technology knowledge and skills needed for competency at the basic level?
- What content, courses, material is needed for these competencies?
- How do we evaluate, measure, and document competency?

The technology sub-group identified the need for a more granular description within the guidelines related to technology use, with examples to help rank ease of adoption (e.g. Zoom can be learned fairly easily, but Oculus needs more assistance).

The **Human Factors Subgroup** discussed these questions:

- What elements of human factors can be leveraged to improve the impact of distance simulation on learners?
- What training do faculty need to maximize distance simulation impact? What environmental obstacles need further research to maximize the impact of the distance and/or virtual learning environment?
- How can human factors experts be leveraged to assist simulation faculty in optimizing the learning environment?
- As distance simulation advances what future latent patient safety issues may arise that need to be addressed (e.g., in situ distance simulation training)?
- How can human factors play a role in optimizing these environments (task analysis research)?

The human factors subgroup identified the need for a conceptual framework or overarching cognitive tool to approach distance simulation and an opportunity to include learner input/end-user feedback for further refinement of the guidelines. The technical aspect of distance simulation needs to be tailored to the task or educational objectives (and not vice versa). Additional consideration needs to be taken to monitor for negative transfer occurring as a result of the telesimulation environment.

The **JEDI (Justice, Equity, Diversity, Inclusivity) Subgroup** discussed these questions:

- How do we differentiate JEDI in distance sim? How can we summarize with to-the-point reflection questions that educators can ask themselves?
- Can JEDI content taught in faculty development training actually effectively create JEDI?
- How should it be part of the faculty development guidelines? Is distance sim privilege by nature?
- How much should an educator flex while maintaining the quality of distance sim (assuming they know the lowest common denominator for technology and access)?

The JEDI subgroup came to consensus that distance simulation is inherently 'privileged' and accessibility of distance simulation formats for learners is a barrier. They produced reflection questions that educators can use to differentiate JEDI and assess their own inclusive practices.

The nominal group technique and findings from the summit were merged into the draft of the distance simulation faculty development guidelines. Track participants were additionally invited to participate in a Delphi study conducted at the 2022 IMSH preconference. A white paper on Phase 1 of the creation of Healthcare Distance Simulation Educator Development Guidelines has since been [published](#).³

Pictogram Track

The Pictogram Track aimed to gain consensus on the essential elements for the visual communication of distance healthcare simulation reporting leading to actionable research, papers, or other scholarly output. The Pictogram track approached the session by describing cases for publication, developing examples and using annotate to convey steps/decisions for visual representation. The participants discussed considerations when displaying figures (e.g. less is more but adequate detail is needed to understand portrayal). Track attendees identified the

potential value of developing a “Pictionary” (like the SSH simulation dictionary) describing what goes into a pictogram. Preliminary steps to achieve this aim were undertaken following the summit by track session leaders performing independent qualitative analysis of track session output to generate themes and key findings.⁹

Future Research: Safety & Acceptability Track

The Safety & Acceptability Track aimed to produce an actionable plan for the creation of scholarship to move the psychological safety and acceptability of distance simulation forward. Given the breadth of psychological safety as a topic, it was projected that this could take many forms, including guidelines, conceptual syntheses, reviews, methodological discussions, and/or qualitative/quantitative research questions. The Safety & Acceptability Research track participants discussed the challenges the distance environment creates for both learners and instructors. The group specifically discussed how cultural, technological, and environmental aspects of distance simulation impacts psychological safety, and reflected on their own experience in the distance simulation environment. The group decided that a model is needed that both merges and contrasts facilitator and learner perceptions of psychological safety in the distance simulation environment. From such a model an assessment approach could be developed and validated that could, in turn, allow for more quantitative research approaches to be taken. Plans were made to develop a semi-structured interview guide via modified Delphi process that could then be used to gather qualitative data from facilitators and learners. Once a model is created from this data, an assessment tool could be developed and validated using this new structure.

Future Research: Educational & Foundational Considerations Track

The Educational & Foundational Considerations Track aimed to develop and prioritize research questions related to how distance simulation modalities effect learning processes in relation to other formats. The group identified several areas that may need further exploration including: what learners want out of distance simulation, what they like and do not like to inform decisions about distance simulation use, cognitive load and engagement of learners and facilitators, and adapting assessment to the distance simulation context (methodology and implementation). This track also touched on diversity, equity, and inclusion (DEI) impact related to educator and learner viewpoint. Future research in this area should involve seeking further input from learners, patients, standardized patients, faculty, etc. This may include comparative studies with the aim of identifying what makes distance simulation work (not necessarily better), what aspects of distance simulation increase effectiveness, and the cost-effectiveness of various types of distance simulation formats.

Future Research: Impact Track

The Impact Track aimed to produce an actionable plan for the creation of scholarship that moves this area of focus (organizational and system-level impact) forward. Given the breadth of impact of distance simulation as a topic, this could take many forms, including guidelines, conceptual syntheses, reviews, methodological discussions, and/or qualitative/quantitative

research questions. The main suggestions that came out of this track session were the need for guidelines, standards, and tools for distance learning. There is a knowledge gap on what constitutes distance simulation and the optimal situation for implementing distance simulation based on objectives and desired outcomes. There is a need to identify and adapt current frameworks for distance simulation including defining standards, guidelines, and possible outcomes as a first step. Track participants felt valid and reliable tools need to be developed or adapted for distance simulation and that measuring impact could inform us of the benefits of distance simulation and future research topics. A Word Cloud activity also identified the need to include DEI considerations when designing a simulation. Future work resulting from this track will be in coordination with other research track teams to measure impact specific to distance simulation.

LESSONS LEARNED

A debriefing session with track leaders and the planning committee convened immediately after the summit. An online evaluation survey was also used to collect feedback and lessons learned from all participants. Responses indicated that the distribution of prework and background resources to registered participants in advance of the summit was viewed as valuable, assisted in providing a shared mental model, and supported the productivity of the meeting. Format of the summit was smooth and engaging, and track session group size provided a supportive atmosphere with lots of enthusiasm. The professional hand-out with links was helpful. Sending 'personal touch' email invites and a 'just in time' message the day before the summit prompted outstanding participation from the renowned experts in simulation, distance technology, and health professions education. Co-facilitators were deemed as essential for the track sessions to monitor chat box comments and guide productive discussion.

Diversity, equity, and inclusion (DEI) was one area for improvement identified in post-summit feedback. GoogleDocs could not be accessed by some institutional emails, and Gmail invites were filtered, limiting preparation and participation for some. While an invite only approach was strategic for consensus, lack of equity in international and disciplinary representation indicates future planning committees may need to be even more intentional in ensuring diversity and inclusivity. Future summits should also include junior researchers, graduate/PhD students, and early career educators and simulationists for learning and mentorship from experts in the field. Future planning committees might also reconsider assignment versus self-selection for tracks or ability for attendees to participate in more than one group. A 'hybrid registration' approach was suggested as one method that could address DEI of future meetings. This would involve inviting experts for a first round of recruitment and providing a general registration window for interested individuals.

Schedule concerns were also voiced during post-summit reflections. There is always some tension between how much time people can commit and how much time is needed for in-depth discussion. Although timing for track sessions was described by some as 'perfect', a 4-hour timeframe would permit more built in breaks and would allow for greater sharing and discussions during the final report-out. In respecting time of attending professionals, weekends should be avoided when scheduling future summits. Sequential or more frequent sessions (e.g. every 6-months) might also allow for greater networking, engagement, momentum and

productivity. A participant evaluation survey should also be prepared for immediate post-summit dissemination for more timely feedback.

Preparation and onboarding of new track leaders was another area of opportunity. Track leaders shared a desire to see how others were planning on structuring their sessions to establish psychological safety and to improve the quality, consistency, and professional culture of track sessions. For clarity and effective progress during track sessions, each track should have leaders that are committed to carrying out next-steps and track follow-up. Additionally, each track should have at least one facilitator that is part of the core planning team and at least one attendee of each session that is a member of the Healthcare Distance Simulation Collaboration with knowledge of the history of the summit.

Lessons from the 2nd Annual Healthcare Distance Simulation Summit will be used to inform the structure and format of a 3rd annual summit in 2022. The 2022 summit planning committee has been formed by summit participants and leaders who expressed interest in their post-summit survey submission. A succession plan and sub-committee structure has been developed to promote sustainability of this annual scholarly meeting. Committee members are actively engaged in discussion about how to best promote inclusivity and networking opportunities while keeping track session groups small and engaging, even if the overall participant group increases. Priority is being given to setting clear expectations, fostering commitment to ongoing initiatives, and post-summit progress reporting and dissemination of scholarly output by the Healthcare Distance Simulation Collaborative.

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