



Published in final edited form as:

*Sex Transm Dis.* 2024 July 01; 51(7): 452–455. doi:10.1097/OLQ.0000000000001970.

## The National STD Curriculum Podcast as a Method to Increase STI Education for Health Care Professionals

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### Abstract

**Background:** Podcasts are a valuable educational tool that are convenient and provide on-demand learning. We launched the National Sexually Transmitted Disease Curriculum (NSTDC) Podcast in 2020 to educate healthcare professionals on sexually transmitted infections (STIs) with an emphasis on content from peer-reviewed literature relevant to clinical practice.

**Methods:** We describe the reach and usage data for 31 podcast episodes produced during the first 29 months. Information was obtained via Google Analytics, Apple Podcasts, the podcast hosting platform Buzzsprout, and the Health Professional Application for Training form for listeners who were registered on the NSTDC website.

**Results:** There were more than 21,000 downloads, with an average of 686 downloads per episode. Although 85% of downloads occurred in the United States, podcast visitors were located in 57 countries. The three most reported professions/disciplines were registered nurse (39.0%), advanced practice nurse (22.5%), and physician (11.3%). Forty-eight percent of visitors had a primary programmatic focus of STDs, 24% HIV/AIDs, and 18% primary care.

**Conclusion:** The NSTDC Podcast is a highly utilized resource for mobile and on-demand learning for health care professionals who want to expand their knowledge on STIs.

### Introduction

Increasing rates of sexually transmitted infections (STIs) in the United States (U.S.) is a significant concern, with many infections remaining undiagnosed and untreated[1]. Education of health care professionals (HCP) to improve knowledge around STI management can reduce stigma, address gaps in knowledge, and optimize patient care[2]. When considering the wide range and interests of contemporary learners, there is an

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Author Contributions:

*All authors confirmed they have contributed to the intellectual content of this paper and have met the following 3 requirements: a) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; b) drafting the paper or revising it critically for important intellectual content; and c) final approval of the version to be published.*

The submitted manuscript is an original contribution not previously published. A poster abstract of preliminary data was presented at the 2022 STD Prevention Conference which was presented virtually. [Conference Program | 2022 STD Preventihttps:// website.eventpower.com/22NCSD/Schedule/Conference-ProgramonConference\(eventpower.com\)](https://www.eventpower.com/22NCSD/Schedule/Conference-ProgramonConference(eventpower.com))

important role for multimedia STI educational content to provide current, clinically relevant information not influenced by commercial funding.

Medical podcasts are a valuable adjunctive education tool increasingly used by medical professionals and health care trainees [3]. Although the number of science podcast series has grown exponentially, few are medically focused and audience engagement metrics are poorly understood[4]. We launched the National STD Curriculum (NSTDC) Podcast in September 2020. To our knowledge, no other medical podcasts focus on STIs for HCPs. We describe the reach and usage data, including demographic and professional data in 31 episodes produced during the first 29 months.

## Methods

The NSTDC Podcast is a free, federally-funded educational resource for HCPs who are interested in remaining up-to-date on the diagnosis, management, and prevention of STIs. Content material is divided into four types: Literature Review, Hot Topics, Conference Summaries, and Expert Interviews. Topics were chosen based on the CDC STI Treatment Guidelines[5], the CDC STI Surveillance Reports[1], review of recently published literature on STIs, presentations at conferences[6], and questions that arose in our STI clinical practice. If a manuscript was chosen as a topic, then a literature review was undertaken to find similar articles on the same topic. The podcast is published on the NSTDC website ([www.std.uw.edu](http://www.std.uw.edu)) and can also be accessed through podcast apps, such as Apple Podcasts, Google Podcasts, and Spotify. This project was funded by the Centers for Disease Control and Prevention (CDC) and supported through the University of Washington STD Prevention Training Center (UW STD PTC) and NSTDC[7].

## Process for Podcast Production

Nine individuals were involved in the production of the NSTDC Podcast. The major activities included research and content development, design and updates to website, episode script writing, recording, editing, coordination of expert interviews, transcript preparation, posting to the NSTDC website and podcast apps, marketing, and data evaluation and analysis.

## Analysis

We evaluated reach and usage data from Google Analytics, Apple Podcasts, and the podcast hosting platform, Buzzsprout for 31 episodes of the NSTDC Podcast published between 9/15/2020–3/1/2023. Data from Buzzsprout was used to determine downloads by episode, geographic location, and device type. A podcast download was tracked through Buzzsprout anytime a listener played an episode via the NSTDC website or through any podcast app. Apple Podcasts was utilized to measure the average percent consumption of each episode, including the average amount of episode listened to and number of times the same individual listened to the podcast. The average percent consumption could exceed 100% if the same individual listened to the episode more than once. Google Analytics was utilized to determine engagement for listeners who visited at least 1 podcast page on the NSTDC using

the following data: pageviews, average time spent on a page, traffic source, and referral source.

In addition, we evaluated demographic and professional data from the Health Professional Application for Training (HPAT) form for listeners who were registered on the NSTDC and signed in when visiting one of the podcast pages on the NSTDC. The HPAT form consists of 11 standardized questions related to geographic location, professional discipline, employment role and setting, and clinical activities related to the care of clients. Data were analyzed and figures were created with Tableau Desktop 2022.2.4.

## Results

### Reach of the Podcast

During the evaluation period, we produced 31 episodes of the NSTDC Podcast[8]. The episodes were an average of 14 minutes 58 seconds in duration. Overall, there were 21,253 downloads, with an average of 686 downloads per episode (range 314–2,276) from 57 countries. Most downloads occurred in the U.S. (n=18,138, 85%), with the highest number of downloads (39%) in the South. A significant number of downloads also occurred in Canada (n=493, 2%), United Kingdom (n=240, 1%), and Australia (n=204, 1%) (Figure 1).

### Audience

A total of 6,326 visitors initiated at least 1 session on a podcast page on the NSTDC website during the evaluation period. Of these visitors, a total of 1,545 (24.4%) had completed an HPAT and were signed-in to the NSTDC website when they initiated the session. Visitors were located in 57 countries. The 1,314 U.S.-based visitors were located in all 50 states, the District of Columbia, Puerto Rico, and Palau. Forty-eight percent had a primary programmatic focus of STDs, 24% HIV/AIDs, and 18% primary care (Table 1). Seventy percent of podcast visitors self-identified as White, 19% Black or African American, and 15% Hispanic/Latinx. Eighty five percent of visitors were female. There was a wide range in the number of patients the podcast visitors provided STI care in the average month (range 0 to more than 50 per month) (Table 2).

### Downloads and pageviews

During the first 18 months, 40% of the downloads occurred from the NSTDC website, but after 29 months, 54% of downloads occurred through Apple Podcasts (Table 3). Of the 11,105 pageviews of the podcast pages on the NSTDC website during the first 18 months (9/15/20–4/14/2022), the most common traffic source was direct, with the visitor typing the site's URL directly into their browser or visiting the site through a bookmark (n=4,605, 42%) (Appendix Table 2). Of the 11,657 podcast pageviews on the NSTDC website in the next 11 months (from 4/15/2022–3/1/2023), the most common traffic source was organic search (n=5,034, 43.2%), meaning that the visitor searched for information in a search engine and then came to the site. We were unable to track how listeners found the NSTDC Podcast on podcast apps. The most common referral sources to the podcast page on the NSTDC website were the CDC (314 sessions referred), National Network of STD Clinical Prevention Training Centers (272 sessions referred), and Twitter (239 sessions referred).

In addition, universities, government agencies, and health care organizations linked to the NSTDC Podcast on their internal learning management systems (LMS)[9].

## Listener Engagement

The average consumption was 85% of the episode (Appendix Table 2). The Literature Review episodes had the highest average percent consumption (87%). The Hot Topic episodes type had the most downloads (n=8,330), with the highest number of downloads for episode titled “Mouthwash for Gonorrhea, Does it Work?” (n=2,276). The Expert Interviews had 3,465 downloads total and an 82% consumption rate, even though it had the longest median length at 22 minutes and 52 seconds.

## Conclusion

We observed >21,000 downloads in 57 countries during the first 29-month evaluation of the NSTDC Podcast. In the U.S., almost 40% of downloads occurred in the South, where bacterial STI rates are high[1]. We found the average consumption was high, regardless of podcast type. The majority of the audience provided STI and/or HIV services, but our audience also included providers who were interested in developing or expanding their expertise in STIs.

In the setting of increasing STIs in the U.S., there is critical need to educate more health professionals on STI prevention, diagnosis, and management[1]. For example, rates of syphilis have increased 79% from 2018 to 2022 in the U.S and in 2022, there were more than 3,500 cases of congenital syphilis[1]. The STI workforce has not kept pace with an expanding STI epidemic. This will require increasing the number of providers and clinics comfortable with sexual health management to deliver high quality, comprehensive STI care reflecting recommendations outlined in the 2021 CDC STI Treatment Guidelines[5, 10]. The STI National Strategic Plan for the United States 2021–2025 emphasizes the importance of and a clear need for science-based STI education for both providers and the public[2].

To support national efforts to expand and strengthen the STI clinical care workforce, innovation is needed to address the education of the vast health care audience. The NSTDC podcast is one way to support this educational need. We found 30% of the audience saw more than 20 patients for STI management in the prior month and up to 18% expected to provide services to patients ages 15–19 years, pregnant people, or MSM. Our data suggest the podcast is a useful resource for providers who want to increase STI knowledge and are serving priority populations.

HCPs are increasingly using medical podcasts to further their knowledge[3]. Podcasts provide a convenient and efficient learning modality, and younger trainees are quick to adopt podcasts as part of their medical education[11]. There are few science podcasts that concentrate on one topic, such as STIs, and very few supported by teaching programs and universities. The connection between the NSTDC podcast and the NSTDC website allows listeners to engage in a variety of complementary and overlapping STI educational efforts [12, 13]. The NSTDC podcast augments the overall NSTDC training mission in several ways. First, the audio-based, mobile, on-demand component of the podcast allows learners

to access content when not at a computer. Second, the podcast is focused on a review of the recent literature, controversial topics, or interviews, all topics that enhance the experience of the learner on the NSTDC website. Third, the podcast content reflects recommendations from the 2021 STI Treatment Guidelines and thus supports evidence-based STI educational content on the NSTDC website[5]. We observed a change in how listeners accessed the podcast over time. While most downloads occurred through the NSTDC website early on, this gradually shifted to downloads through podcast apps, indicating more listeners were directly seeking the NSTDC podcast as a podcast resource. Although we could determine the source of the downloads, we were not able to track how listeners found the podcast on the apps.

There are several limitations of our analysis. First, only a subset of listeners were registered and completed the HPAT and thus may not represent the overall population of listeners. Second, we did not formally analyze the specific effort and time required to produce each podcast, but other medical education podcasts have reported an average time commitment of roughly 10 hours per episode with a maximum of 40 hours per episode[14]. Our time commitment per episode decreased over time as the process became more streamlined. Third, we don't know how the NSTDC podcast enhances knowledge or practice changes, but others have shown that medical podcasts contribute to knowledge retention and behavior change outcomes[3].

In summary, the NSTDC Podcast is a widely utilized resource that supplements and enhances the overall goal of the federally-funded NSTC website to promote learning about STIs. The podcast modality of education has the means to reach diverse groups of HCPs working in the field of STIs in the U.S. and elsewhere. We believe our increasing usage indicates the podcast is reflective of a growing audience supportive of this method of learning.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments:

We thank Dr. Matthew Golden and Dr. Julia Dombrowski for their mentorship and support. We acknowledge the outstanding work of the National STD Curriculum Podcast team and the National STD Curriculum team and we are grateful to the interviewees, the University of Washington STD Prevention Training Center, and the Centers for Disease Control and Prevention.

## Funding:

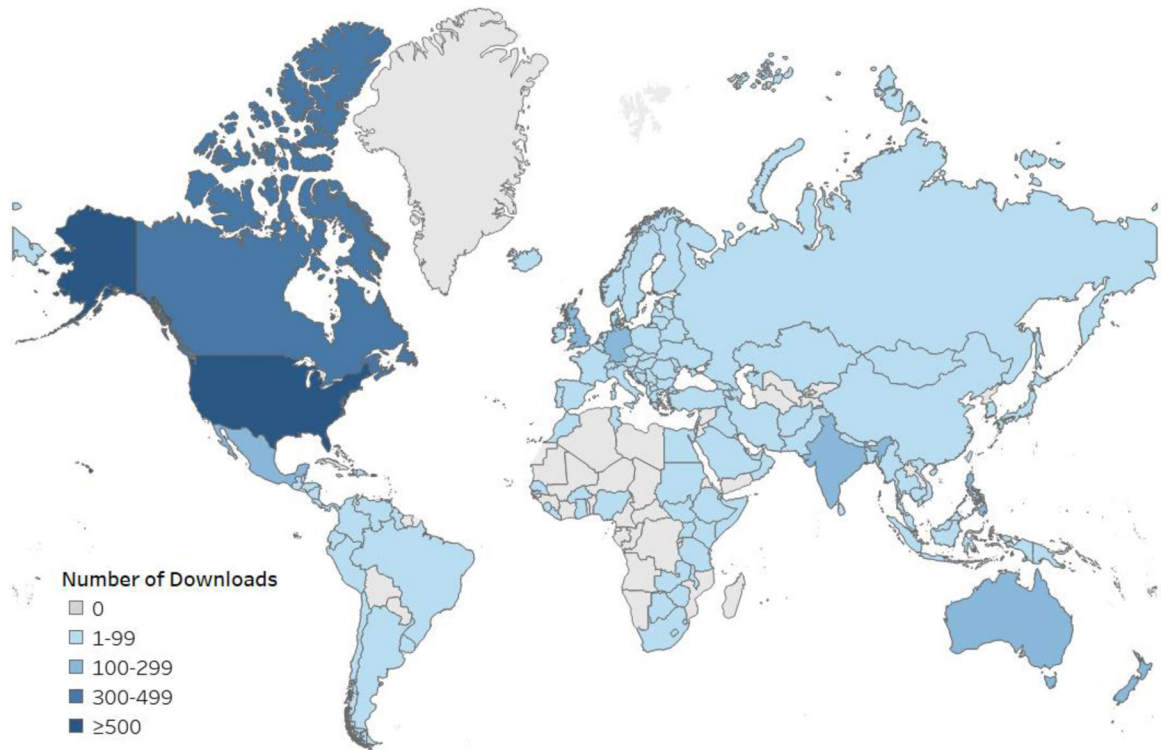
Research reported in this publication was supported by a grant from the Centers for Disease Control and Prevention

## Conflicts of Interest and source of funding:

The National STD Curriculum Podcast is funded by the Centers for Disease Control and Prevention. MR received institutional research funding from Nabriva unrelated to this project which has since ended. CJ received consulting funding from GSK and Assembly Biosciences and research funding from GSK and Moderna unrelated to this project. Other authors reported no conflicts of interest related to this project.

## References:

1. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2022. Atlanta: U.S. Department of Health and Human Services; 2024. <https://www.cdc.gov/std/statistics/2022/default.htm>. Accessed January 2024.
2. U.S. Department of Health and Human Services. 2020. Sexually Transmitted Infections National Strategic Plan for the United States: 2021–2025. Washington, DC.
3. Kelly JM, Perseghin A, Dow AW, et al. Learning Through Listening: A Scoping Review of Podcast Use in Medical Education. *Acad Med* 2022; 97(7): 1079–85. [PubMed: 34935729]
4. MacKenzie LE. Science podcasts: analysis of global production and output from 2004 to 2018. *R Soc Open Sci* 2019; 6(1): 180932. [PubMed: 30800351]
5. Workowski KA, Bachmann LH, Chan PA, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. *MMWR Recomm Rep* 2021; 70(4): 1–187.
6. STI Prevention Conference. <https://www.cdc.gov/stdconference/previous.htm>. Accessed January 2024.
7. Spach DH. National STD Curriculum. University of Washington. <https://www.std.uw.edu/>. Accessed March 2023.
8. National STD Curriculum Podcast. <https://www.std.uw.edu/podcast>. Accessed January 2024.
9. Apple Podcast for Creators. Measure Podcast Performance. <https://podcasters.apple.com/support/840-check-your-podcast-performance>. Last accessed March 30, 2023.
10. Barrow RY, Ahmed F, Bolan GA, et al. Recommendations for Providing Quality Sexually Transmitted Diseases Clinical Services, 2020. *MMWR Recomm Rep* 2020; 68(5): 1–20. [PubMed: 31899459]
11. Purdy E, Thoma B, Bednarczyk J, et al. The use of free online educational resources by Canadian emergency medicine residents and program directors. *CJEM* 2015; 17(2): 101–6. [PubMed: 25927253]
12. Snoeyenbos Newman G, Bauer K, et al. Evaluation of the National Sexually Transmitted Disease Curriculum: Reach, Utilization, and Engagement. *Sex Transm Dis* 2020; 47(6): 412–8. [PubMed: 32413019]
13. Spach DH, Johnston CM, Workowski KA. National STD Curriculum. University of Washington. <https://www.std.uw.edu/>. Accessed March 2023.
14. Tarchichi TR, Szymusiak J. Continuing Medical Education in an On-Demand World: Is Podcasting the Netflix of Medical Education? *Hosp Pediatr* 2019; 9(10): 818–9. [PubMed: 31481459]



**Figure 1.**  
Total Number of Downloads of National STD Curriculum Podcast by Country. Darker blue represents a greater number of downloads from that country.



**Table 1.** Number and percentage of registered and signed-in podcast visitors by demographics

Race (more than one answer selected)	n	%
White	916	69.7%
Black or African American	244	18.6%
Asian	162	12.3%
American Indian or Alaska Native	60	4.6%
Native Hawaiian or Pacific Islander	20	1.5%
<b>Hispanic, Latino/a, or Spanish origin</b>		
Yes	196	14.9%
No	1,118	85.1%
<b>Gender</b>		
Female	1,115	84.9%
Male	156	11.9%
Decline to answer	18	1.4%
Non-binary	18	1.4%
Transgender man	4	0.3%
Transgender woman	3	0.2%
<b>U.S. Census Bureau Regions *</b>		
South	507	38.8%
West	342	26.2%
Midwest	269	20.6%
Northeast	189	14.5%
<b>Primary Programmatic Focus (select up to two)</b>		
STD	628	47.8%
HIV/AIDS	314	23.9%
Primary care (e.g. general/family medicine)	236	18.0%
Reproductive health/family planning/women's health	210	16.0%
Public health	199	15.1%



Race (more than one answer selected)	n	%
Adolescent and/or pediatric health	67	5.1%
Labor and delivery/OB/GYN	59	4.5%
Other infectious diseases	52	4.0%
Emergency medicine/urgent care	51	3.9%
Medical/surgical nursing	43	3.3%
Critical care	38	2.9%
TB	27	2.1%
Mental/behavioral health	26	2.0%
Hepatitis	21	1.6%
Cardiology/cardiac care	19	1.4%
Surgery	16	1.2%
Addiction medicine	10	0.8%
Recovery support/trauma/domestic violence	7	0.5%
Oral health	1	0.1%
Other	88	6.7%

\* Puerto Rico is not part of any U.S. Census Bureau Region, therefore learners from Puerto Rico (n=7) have been excluded from the total.

Number and percentage of registered and signed-in podcast visitors by professional characteristics and patient care services

**Table 2.**

Profession/Discipline	n	%
Registered nurse	513	39.0%
Advanced practice nurse	296	22.5%
Physician	149	11.3%
Other	356	27.1%
<b>Number of Clients/Patients Provided with STD Screening, Diagnosis, or Treatment in an Average Month</b>		
None/month	365	27.8%
1–9/month	315	24.0%
10–19/month	221	16.8%
20–49/month	206	15.7%
50+ /month	207	15.8%
<b>Provide Direct Services to Client/Patients who are Ages 15–19</b>		
Yes	910	69.3%
Not now, but expect to in the future	201	15.3%
No	203	15.4%
<b>Provide Direct Services to Client/Patients who are Ages 20–24</b>		
Yes	1,030	78.4%
Not now, but expect to in the future	174	13.2%
No	110	8.4%
<b>Provide Direct Services to Client/Patients who are Pregnant</b>		
Yes	738	56.2%
Not now, but expect to in the future	229	17.4%
No	347	26.4%
<b>Provide Direct Services to Client/Patients who are Men who Have Sex with Men (MSM)</b>		
Yes	872	66.4%
Not now, but expect to in the future	230	17.5%
No	212	16.1%

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Table 3.

Percent of National STD Curriculum Podcast Downloads by App Type

App Type	9/15/2020–4/15/2021	9/15/2020–3/1/2023
Web Browser (i.e. NSTDC)	40%	17%
Apple Podcasts	28%	54%
Unknown Apple Apps	12%	11%
Google Podcasts	5%	3%
Spotify	5%	5%
Total	100%	100%