Patient-reported outcomes and home-based self-swabs for influenza-like illness events - Lessons learned from the DANFLU-2 HomeSwab PRO Study 23/24

Author names: Filip Soeskov Davidovski, MD[1,2]; Kristoffer Grundtvig Skaarup, MD[1,2]; Niklas Dyrby Johansen, MD[1,2]; Daniel Modin, MD[1,2]; Nabila Shaikh, MSc[4]; Jose Bartelt-Hofer, PhD[6]; Erica Deuger DVM, PhD[6]; Matthew M. Loiacono, PhD[4]; Rebecca C. Harris, MBioch, MSc, PhD[5]; Robertus van Aalst, PhD[4]; Marine Dufournet, PhD[6]; Carsten Schade Larsen, MD, DMSc[7]; Lykke Larsen, MD, PhD[8]; Lothar Wiese, MD, PhD[9]; Michael Dalager-Pedersen, MD, PhD[10,11]; Randi Jessen, PhD[18]; Nina Steenhard, PhD[18]; Brian L. Claggett, PhD[12]; Scott D. Solomon, MD[12]; Martin J. Landray, PhD[3]; Gunnar H. Gislason, MD, PhD[1,13,14,15]; Lars Køber, MD, DMSc[13,16]; Pradeesh Sivapalan, MD, PhD[13,17]; Jens Ulrik Stæhr Jensen, MD, PhD[13,17]; Cyril Jean-Marie Martel, PhD[18]; Tor Biering-Sørensen, MD, MSc, MPH, PhD[1,2]

BACKGROUND

- Patient-reported outcomes (PRO) and self-swab studies may offer to improve the monitoring of infectious diseases by creating:
  - Real-time symptom reporting, insight into symptom burden and quality of life (QoL), and decentralized/remote monitoring.

AIM

- The DANFLU-2 HomeSwab PRO 23/24 study aimed to assess the practicality of self-administered swabs and digital PRO tracking to monitor influenza-like illness (ILI).

METHODS

- Participants were recruited from the DANFLU-2 trial at various vaccine sites in Copenhagen (Denmark) from September 28th to October 2nd, 2023.
- If symptomatic, a home-based self-swab was performed, registered via a QR code through a web app to link the swab to the study ID, and mailed to a central center for PCR testing by the participant.
- In addition, participants were instructed to self-report ILI and QoL online using the Respiratory Intensity and Impact Questionnaire (RiiQ) for 14 days following symptom onset. After symptom onset, each RiiQ was sent daily in a governmental electronic letter system (E-Boks). Furthermore, weekly compliance reminders were sent through E-Boks.

RESULTS

1,976
Participants above 65 years old from the DANFLU-2 trial were enrolled.

89.4%
Of participants with an ILI event performed a self-swab within a median of 1 day [IQR: 0; 3] from ILI symptom onset.

208 (10.5%)
Of participants filled out at least one RiiQ.

65.8%
Of home swabs were correctly registered by the participants in the web app through a QR code and thereby linked to their study ID.

171 (82.2%)
Of the 208 completed RiiQ fulfilled the ILI case definition.

96.5%
Of all home swabs tested RNaseP positive.

82.7% [IQR: 64.3; 100]
Completed all 14 days of RiiQs following an ILI event.

1.8% (36 participants)
Withdrew from the study after a median of 59 days [IQR: 25; 108]. Weekly reminders was the primary reason for dropout.

51.4%
Of the 208 participants required a phone reminder sometime during the 14 days of RiiQ due to a 48-hour non-response period of not reporting symptoms.

2.0% monthly reminders
2.4% no reminders
To reduce dropouts, the possibility of adjusting frequency of reminders was offered, where participants could reduce to monthly or no reminders.

CONCLUSION

The study provided the feasibility of using home-based self-swabs in an influenza study, with 96.5% of swabs being RNaseP positive and 89.4% performing the home swab within 1 day of symptom onset.

Digital PRO tracking of RiiQ for 14 days proved feasible with an 82.7% completion rate.

Highlighted areas for improvement are: More simple registering of home swabs for this age group of participants, amount of reminders and amount of days with questionaires

Affiliation: [1] Department of Cardiology - Herlev and Gentofte, Copenhagen, Denmark, [2] Center for Translational Cardiology and Pragmatic Randomized Trials, Department of Biomedical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, [3] Nuffield Department of Public Health, University of Oxford, [4] Sanofi, Swiftwater, Pennsylvania, USA, [5] Sanofi, Singapore, [6] Sanofi, Lyon, France, [7] Department of Infectious Diseases, Aarhus University Hospital, [8] Department of Infectious Diseases, Odense University Hospita, [9] Department of Infectious Diseases, Zealan, [10] Department of Infectious Diseases, Aalborg University Hospital, [11] Department of Clinical Medicine, Aalborg University Hospital, [12] Cardiovascular Division, Brigham and Women's Hospital, Harvard Medical School, [13] Department of Clinical Medicine, Faculty of Health and Medical Sciences, University of Copenhagen, [14] The Danish Heart Foundation, Copenhagen, Denmark, [15] The National Institute of Public Health, University of Southern Denmark, [16] Department of Cardiology, Copenhagen University Hospital – Rigshospitalet, Copenhagen, [17] Respiratory Medicine Section Department of Medicine, [18] Statens Serum Institut

COI: KGS has served on a Sanofi advisory board. NS, MML, ED, RCH, MD, RvA, and MD are full-time employees of Sanofi and may own shares and/or stock options in the company. CSL has received speaker fees and served on advisory boards for GSK, MSD, Pfizer, Takeda, and Valneva. BLC has received consulting fees from Amgen, Cardurion, Corvia, Myokardia, and Novartis. SDS has received research grants from Actelion, Alnylam, Amgen, AstraZeneca, Bellerophon, Bayer, BMS, Celladon, Cytokinetics, Eidos, Gilead, GSK, Ionis, Lilly, Mesoblast, MyoKardia, NIH/NHLBI, Neurotronik, Novartis, Novo Nordisk, Respicardia, Sanofi, Theracos, US2.AI and consulted for Abbott, Action, Akros, Alnylam, Amgen, Arena, AstraZeneca, Bayer, Boehringer Ingelheim, BMS, Cardior, Cardurion, Corvia, Cytokinetics, Daiichi-Sankyo, GSK, Lilly, Merck, Myokardia, Novartis, Roche, Theracos, Quantum Genomics, Cardurion, Janssen, Cardiac Dimensions, Tenaya, Sanofi, Dinaqor, Tremeau, CellProThera, Moderna, American Regent, Sarepta, Lexicon, Anacardio, Akros, and Puretech Health. LK has received speaker fees from Novo Nordisk, Novartis, AstraZeneca, Boehringer Ingelheim, and Bayer. TB-S has served as chief investigator of the Sanofi financed NUDGE-FLU trial, the Sanofi financed DANFLU-1 trial, and the Sanofi financed DANFLU-2 trial, served as steering committee member of the Amgen financed GALACTIC-HF trial, the Boston Scientific financed LUX-Dx TRENDS trial, and the Boehringer Ingelheim financed EASi-KIDNEY trial, served on advisory boards for Sanofi, GSK, Amgen, and CSL Squirus, received speaker honoraria from Bayer, GSK, Novartis, GE Healthcare, and Sanofi, consulted for Novo Nordisk, IQVIA, and Parexel, and received research grants from GE Healthcare, Sanofi, Boston Scientific, AstraZeneca, and Novo Nordisk. All other authors declare no competing interests.

Presenter: Dr. Filip Soeskov Davidovski, filip.soeskov.davidovski@region.dk

Funding: The DANFLU-2 HomeSwab trial is funded by Sanofi