

Ryan Wolf J, Zhang L, Xie Y, Pentland AP, Pentland BT. (2023) Visualization of Covid-19 pandemic influence on healthcare routines in dermatology using electronic health record data. *Journal of Investigative Dermatology*, 143(5): S119. PMC10106947. <https://doi.org/10.1016/j.jid.2023.03.699>.

Visualization of Covid-19 pandemic influence on healthcare routines in dermatology using electronic health record data

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Introduction: The Covid-19 pandemic transformed the landscape of the healthcare system. However, how the pandemic may have altered healthcare routines and if these shifts were transient is unclear. We examined the effects of Covid pandemic on dermatology healthcare routines using the electronic health record (EHR) system. **Methods:** This retrospective study compared the patterns of actions in University of Rochester Dermatology using the EHR audit trail for 29,862 clinical visits from January 2020-June 2020 and January 2021-March 2021. We used R-coded software, ThreadNet, to characterize clinic visit routines as a network of actions. We examined changes in visit numbers, unique roles (i.e., staff), handoffs (i.e., changes from one role to another role), touchpoints (i.e., block of actions by one role, at one workstation, during one visit) during various phases of the pandemic. Statistical analyses were performed at 0.05 significance level using R. **Results:** Although differences were observed in visit numbers across our pandemic timeframe, these differences were not significant. Reductions in handoffs, touchpoints, and unique staff are observed in March-April 2020 compared to January-February 2020 ($p < 0.001$). Compared to 2021 visits, reductions in unique staff were observed for March-June 2020 ($p < 0.04$). Interestingly, handoffs and touchpoints only showed reductions for March-May 2020 ($p < 0.001$). **Conclusions:** The EHR audit trail enables disruptions healthcare routines visible and measurable. Healthcare routines became simpler during the pandemic and gradually more complex in 2021. Some patterns of actions, such as handoffs and touchpoints, are more affected than others. Further exploration is necessary to fully understand the resiliency of healthcare routines from external disruptions. This research was supported by NSF (HNS-2120530) and University of Rochester CTSA (UL1 TR002001).