

Z-POINT: An Adaptable Data System for Outbreak Related Case Review Designed for the Zika Emergency Response

John F. Nahabedian III¹, Nicole Roth¹, John Sims², Anna C. Fulton¹, Sascha Ellington², Romeo R. Galang²

¹Eagle Global Scientific, LLC; ²Division of Congenital and Developmental Disorders, National Center on Birth Defects and Developmental Disabilities, CDC

Background

- In 2016, the Centers for Disease Control and Prevention (CDC) initiated an emergency response to the Zika virus (ZIKV) outbreak
- US Zika Pregnancy and Infant Registries (USZPIR) established to monitor outcomes among pregnant women with laboratory evidence ZIKV infection and their infants
- USZPIR data are reviewed by health scientists
- Adverse outcomes potentially associated with ZIKV infection are identified (ZIKV-related birth defects like microcephaly)
- Cases are classified according to standardized surveillance case definitions
- During an emergency response, data collection methods are rapid and dynamic, requiring efficient and adaptable review systems



Zika Pregnancy of Interest Navigation Tool (Z-POINT)

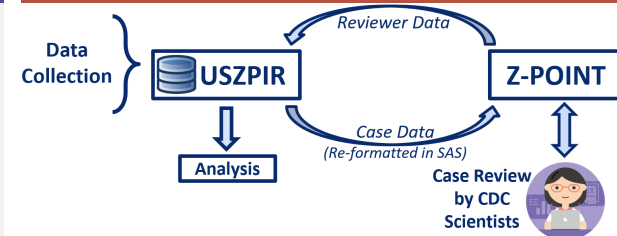
Features

- Familiar Data Organization** – Like an EMR
- Auto-save** – Z-POINT automatically saves reviewer data upon exit of a control
- Search Feature** – Users can easily skip to a record of interest by typing a unique record ID
- Exportable Data** – Reviewer data can be exported to Microsoft Word or Microsoft Excel in tabulated format

Features Most Helpful for Case Review

- Growth Percentile Calculation** – Infant growth percentiles for gestational age & sex (INTERGROWTH-21st and WHO standards) are calculated automatically.
- Age-at-Event Calculations** – Age (months) is calculated for measurements and events to allow reviewers to easily evaluate changes over time.
- Automatic Summary Generation** – Concise, editable narrative clinical summaries are automatically generated and are easily exported.
- Standard Data Entry for Classifications** – Reviewers record classification decisions within Z-POINT using a form standardized to the CDC surveillance case definitions
- Built in Calculators for Manual Validation of Growth Percentiles and Gestational Age** – Growth percentiles for head circumference, weight, and length can be manually calculated. Users can select to compare against multiple standards. Many age calculators are also available.

Workflow



- Data are exported from the USZPIR database (REDCap), reformatted in SAS, & temporarily uploaded to Z-POINT
- Z-POINT is only used for the case review process.
- Case review then uploaded to USZPIR and available for analysis

Results

- Over 30,000 individual records have been reviewed using Z-POINT and these data have been featured in several publications
- Z-POINT effectively reduced the workload of the case review process several-fold by automatically re-formatting data, performing complex calculations, and writing complex clinical data summaries
- Fourteen versions of Z-POINT have been successfully designed to interface with a diversity of data sets (domestic & international)

Discussion

- Z-POINT addressed challenges in conducting pregnancy and birth defect surveillance in the setting of rapidly evolving knowledge of an emerging public health threat
- The successful implementation of Z-POINT for the CDC Zika Emergency Response and ongoing Zika surveillance has showcased its capability to be a valuable asset for case review and data analysis efforts
- Z-POINT has allowed for rapid review of data that have been critical to understanding ZIKV infection and informing clinical guidance for care of affected pregnant women and infants
- The adaptability of Z-POINT demonstrates its potential as a valuable tool that can be applied to future public health emergencies

Contact Info

John F. Nahabedian III, MS
Eagle Global Scientific, LLC
Infant Outcomes Monitoring,
Research, and Prevention Branch
Email: jnahabedian@cdc.gov
Tel: 404-989-9918

