

Can EMR Data be Used for National Health Statistics?

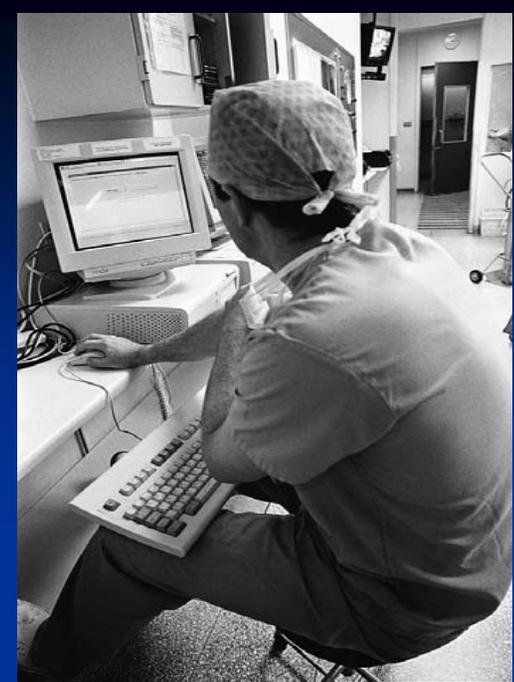
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Background

- KPNW Epic Ambulatory Care EMR since January 1997.
- Installation = technical tour-de-force & cultural watershed.
- Older cohort of MDs considered keyboarding to be “women’s work” and retired.
- Younger physicians took the EMR to the limit.
- “Alert overload” = ↓ system performance, ↑ MD burnout, ↑ alert cancellation.
- Alerts should be carefully calibrated and timed, with easy bypass.
- Most MDs document patient visits while talking with their patients and will turn the displays to show patients their medical data.
- This presentation is a synthesis of my experiences with using multiple EMRs for research through collaborations among members of the HMO Research Network over the past 10 years.
- EMRs have been a boon to health services, epidemiological, health economics, clinical trials, and translational research!

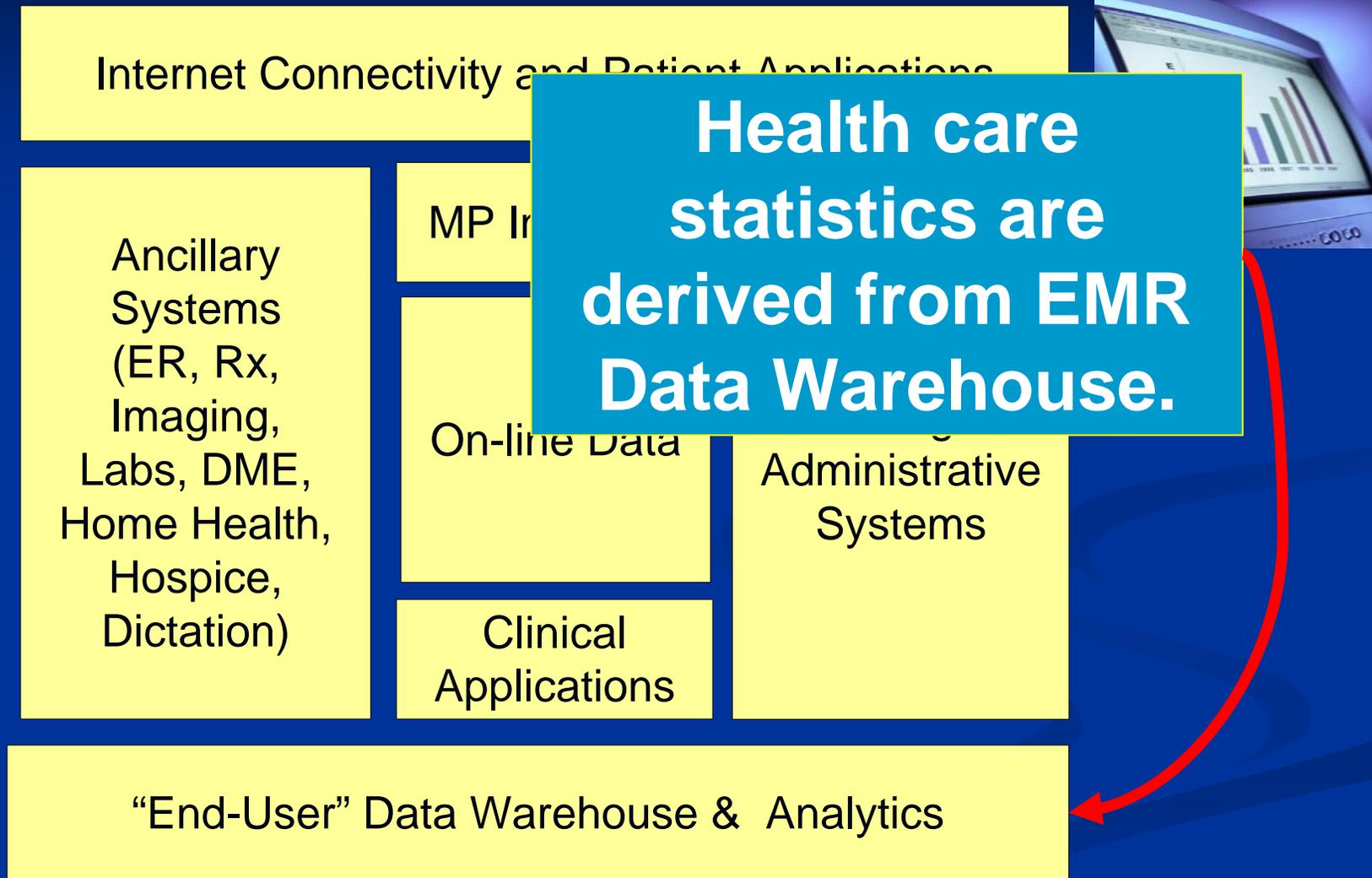


Objectives of Presentation

- What do we know about the quality, completeness, accuracy, comprehensiveness, and timeliness of EMR data in private and public health systems?
- What do we know about the cost of accessing and converting EMR data for use in health care statistics?



The EMR: A Component View

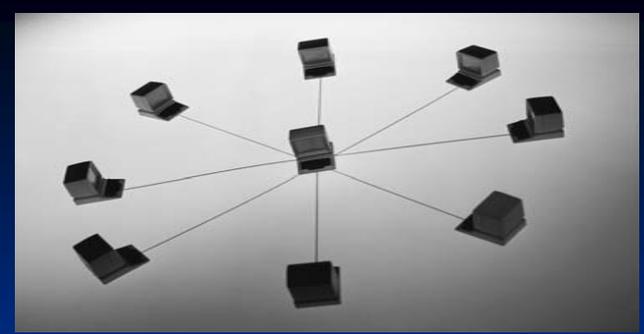


EMR = Medico-Legal Standard



- EMRs are the gold standard for medico-legal data.
 - No back-up hard-copy system that contains additional information.
 - Data quality is assessed via logical interrelationships among the various EMR data elements.
- Interoperability is still a promise.
 - EMRs are customized to the user, so even when clinics are using EMRs from the same vendor, the systems are not identical.
- As with hard copy charts, EMRs are only as good as the accuracy, attentiveness, and comprehensiveness of the clinician/assistant who is entering the data.
- EMRs can be designed to increase or inhibit data quality and integrity.

Multiple Interfaces



- Appointments clerk (appointing and registration)
- Medical assistant (vital signs and chief complaint)
- Clinician (history, physical, notes, referrals)
- Laboratory technician
- Pharmacist/pharmacy technician
- PT/OT/ST/RT/Home Health/Hospice/DME (procedures, clinical notes, equipment)
- Confidential e-mail (provider to provider, provider to patient, patient to provider)
- Telephone visits

EMR = Access, Quality



- Chart is nearly always accessible, no matter when or where a patient receives care within the organized delivery system.
- Patients receive an after-visit summary in hard copy form.
- Many patients opt for confidential email messaging to their clinicians.
- Laboratory and imaging test results are disseminated instantly via web-based confidential email.
- Patients can make or cancel appointments online and refill Rx's online.

EMR Data Problems

- Recording biases
- Missing mother-baby links



EMR Recording Biases

- In capitated systems, providers have historically minimized diagnosis and procedure coding.
- Documentation incentives must be parallel between capitation and fee-for-services systems for semantic interoperability.
- HMO recording incentives:
 - Medicare compliance regulations.
 - Medicare risk-adjusted payment formula
 - Quality assurance programs (HEDIS, etc.)



Mother-Baby Linkages



- Newborns are given mother's health record number for the remainder of the birth month. Fetuses and stillborns are not counted as members.
- Newborn's diagnoses show up on maternal delivery record, even when they are illegal codes.
- Newborn may not be linked to mother if baby goes to another health plan account, divorce settlement, or adoption.
- Need a special variable and tracking procedure to link newborn with birth mother at time of birth.

Converting EMR Online Data to Data Warehouse

- Online EMR data are stored in a form to maximize efficiency for random access to individual patient records.
- Online data tables are converted to relational flat files for aggregative analysis for research, operations analysis, and policy evaluation.



Who Should Pay?



- Research alone cannot pay the costs of building an end-user database for EMRs.
- End-user EMR databases must be incorporated into the design of EMRs and must be funded by medical care dollars.
- EMRs have to be the physicians', managers', and researchers' work environment. It is their gateway into their professional work.
 - All three classes of users benefit from group-wise analysis and patient-level data quality checks.

How Good Are EMR Data?



- Quality = as good as provider input.
- Completeness = as good as provider input.
- Accuracy = as good as provider input.
- Comprehensiveness = ambulatory care OK; inpatient care still spotty.
- Timeliness = outstanding, if the system is uploading clinical and business transactions data daily into a data warehouse for aggregative analysis.

Conclusions



- EMRs are becoming a common infrastructure for care delivery.
 - 25% of physicians now using EMRs.
- Many of the envisioned benefits of EMRs will require overcoming challenges related to data accuracy, completeness, and interoperability.
- Informatics developments (e.g., Natural Language Processing) show promise for overcoming important data challenges.

