

Each groups recommendation for the case study:

Group 1

The proposed recommendations would amount to the \$3 million received by the grant funding. This implementation will include the creation of the data repository infrastructure for all inpatient settings and the emergency department. The installation in these areas would cost \$1.5 million; however, the infrastructure would enable e-prescribing service installation for \$500,000 as well as the clinical quality service for \$500,000. Operational costs for the data repository in all inpatient and emergency settings and the two services would reach the height of \$710,000 but these costs would be reduced by the contributions from various parties up to \$275,000. Therefore, the total operational costs associated with the proposed recommendations would be \$435,000. There is a great deal of value from developing the EHR system. E-Prescribing can “[improve the] quality of health care services, increase the efficiency and effectiveness of prescribing and dispensing medications, reduce medication errors, and health care cost savings (Zadeh and Tremblay, 2016, Para. 4)”. The end goal of this [recommendation] is to increase the quality of patient care by sharing health information with healthcare providers in the area (Abdelhamid et al., 2017)

The successful implementation of RCHIE will incorporate the EHR with accurate security and privacy issues, Clinical Information Repositories, and e-Prescribing services with proper infrastructure. Despite the issue of funding, RCHIE can be achieved by relying on the meticulous allocation of the available funds from grant funding. The reduction of funding from \$6 million is bothersome, but the EHR systems can be fully integrated with the exception of clinical messaging services. A portion of the funds will be allocated to establishing the clinical quality services which assists in reducing the overall cost of implementation. Additionally, there are opportunities for supplemental income via the Rural Economic Development Loan (REDL) and Rural Economic Development Grant (REDG) programs. These programs can provide funding for “rural projects through local utility organization by financing fixed assets [such as] real estate, buildings, and equipment” among other costs (Trustees of Rural Health Information Hub, 2020). Furthermore, the RCHIE board should consider authorizing access to AZER Biomedical clinical information repository service for an additional \$300,000 annually.

The largest push for implementation should reside in e-prescribing and clinical quality services due to these options being the path of least resistance for RCHIE. The implementation process will lead to apparent obstacles that should be addressed. The main obstacle facing the RCHIE board is the financial problem that will be settled by relying on loans and donations from external organizations to surpass the debt exceeding \$200,000 in operating costs. Additionally, the direct impact on healthcare should be considered. The implementation will negatively influence the workflow of physicians. This may result in an issue of quality within the cooperating healthcare organizations. However, the rationale remains that the lasting benefits for the rural community will outweigh the temporary costs of implementation. Having a health

information exchange enables easier access to information for all stakeholders that treat rural patients (Sharma & Felix, 2016). The benefits would include higher quality of patient care stemming from the “reduction of duplicated procedures, lower costs, and increase patient safety (Menachemi, et al., 2018). There is reason to believe these services will improve patient awareness regarding information sharing which in turn improves the stakeholders’ knowledge of the concerns, such as privacy and security.

The overarching goal of RCHIE is to become self-sustaining; however, reaching that phase will require external support from third-party organizations. RCHIE plans to utilize REDL, REDG, and the Health Center Facility Loan Guarantee to receive up to \$4.5 million. The RED loan will secure \$2 million, the RED grant will fund up to \$300,000, and the Health Center Facility loan will finance up to 80% of the slated costs (Trustees of Rural Health Information Hub, 2020). These funds can be used to complete the implementation phase and progress efforts towards becoming self-sustaining. The implementation leads to producing \$725,000 minimum per year, most of which will go to operating costs. Other efforts include charging a proportional fee to each RCHIE organization. This method may receive backlash, but it is a viable option to diminishing financial dismay in the future. Another consideration is to charge organizations, such as AZER Biomedical an annual fee of \$300,000 to receive access to the repository. This introduces an ethical component to the implementation, but acceptable from a legal standpoint. These methods will empower RCHIE to become financially independent while upholding its core values.

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Group 2

What services would you recommend implementing and/or expanding?

The RCHIE Board members in our group had similar thoughts in implementing some of the services. 60 percent of the Board members were in favor of implementing the infrastructure at first. They believed having a proper Infrastructure is the key to other developments as well. By having a well build infrastructure, we can go for Clinical Information repository service which is beginning with an emergency department and by including prescribing Services, Clinical Quality/Pay-for-value, administration services and Clinical Messaging services. This could be covering the deficit budget of 3 million dollar which was earlier expected to receive as a grant. After all The e-health network serves to provide added value to its various stakeholders through syndication, aggregation and distribution of this health information, thereby reducing costs and improving efficiencies (Stephanie, F.L., & Sharma, R.S., 2016).

Another group of Board member doesn't want to invest for the infrastructure instead they wanted the Clinical Messaging services and Clinical information Repository services to be in place. It is expected to have a very good clinical impact for the physicians and staff considering the ease and accuracy of conveying the labs, radiology studies, as well as clinical documentation including consultants' notes. In addition, it is expected to reduce the costs related to the communication of these reports in addition to the costs of repeating the labs or imaging studies due to miscommunication. Developing systems like Clinical Messaging Services and Clinical Quality/Pay-for-Value Administrative Services could bring some income into the cycle.

How will this be accomplished with the reduction in grant funding?

Board members who suggested Infrastructure as the priority has a different plan from who have suggested implementing other services like Clinical Messaging services and Clinical information repository services. The starting amount is \$3 million due to the reduction in state funding. However, there are resources tailored to rural communities that would help offset the initial loss of funding. These resources include two grants and/or loans: Rural Economic Development Loan and Grant Program (REDL and REDG) and Leveraging Health Information Technology (Health I.T.) to Address Minority Health and Health Disparities. The REDG grant offers a maximum of \$300,000 while REDL allows for loans of up to \$2 million dollars (Trustees of Rural Health Information Hub, 2020). Leveraging Health I.T. does not have a cap on funding provided (Abdelhamid, M., Gaia, J., & Sanders, G.L.,2017). In addition to funding, a membership fee of \$175,000 can also be implemented.

Ongoing a bit deep into the figures, it is found that infrastructure alone would be costing 2 million dollars with a maintenance fees of 285 thousand dollars per year. Emergency clinical repository would be costing around another half a million and an annual maintenance fees of 175 thousand dollars. Electronic prescribing though costs up to 0.4 million it comes with an added advantage that it does not have an annual recurring cost. On the other hand, services like Clinical Messaging Services, and Clinical Quality/Pay-for-Value Administrative Services though have an investment in starting to bring an income of 100 and 175 thousand dollars

respectively (Menachemi et.al., 2018). Apart from all these there is a need to continue apply for grants or else RCHIE would go into a negative balance.

Board members who prioritize other services above Infrastructure had a different plan in mind. Considering all the positive aspects it is expected to generate some additional money per year through clinical messaging services. E-Prescribing Services can generate the income to service the other sectors because it would save money through better conformance to medication formularies and generic prescribing, as they are willing to pay RCHIE \$100,000 over and above costs for this service. Clinical Quality/Pay-for-Value Administration Services can generate \$175,000 per year over and above its costs which could also help a great deal in servicing the other sectors.

An explanation of the rationale behind your recommendation in terms of the benefits, costs, and obstacles associated with the various services.

The board members in our group had similar rationalizations for implementing the various services. All members were in agreeance to implement the infrastructure that supports the interoperability of the services. However, the board members were weary of the high upkeep cost of \$285,000 per year and recognize that ensuring funding for this will be an obstacle.

The Clinical Information Repository Service was recommended by 80% of the group. The accessibility of patient information is beneficial to both providers and patients. Maintaining data bases of clinical information increases the quality of care patients receive (Menachemi et.al., 2018). Of the 80% in support of the repository, 75% agreed upon an initial implementation only in the emergency department because it had the lowest implementation and yearly costs. The obstacles surrounding the repository caused one member to choose not to implement it. The high cost of implementation would drain the board's limited resources. His suggestion is to wait until further grant money is obtained and the board has reassurance that the project is going well.

The ePrescribing Service has many benefits. It gives providers a helpful receive that would improve patient care and ensure safe prescription practices. The system's ability to show interactions among medications and labs helps avoid harmful outcomes and improves patient safety (Menachemi et.al., 2018). Two of the board members liked that it would save money by bettering provider conformance to formularies and generic prescribing. One of the board members praised its lack of annual fees. However, two members were concerned with its known workflow issues, and believe they would need people to monitor it. However, they agreed that the benefits would outweigh the risks.

The Clinical Messaging Service is thought to increase communication among providers with laboratory results, radiology studies, and clinical documentation. It may reduce costs in the long run because it can contribute to a future health information exchange (Menachemi et.al., 2018). An added benefit is the funding it will bring in annually. However, a big obstacle is the Big City Medical Center's (BCMC) conflict of interest due to their existing portal. One board member is nervous about the possibility of the hospital refusing to participate in a membership fee if they must change their current system. Communication with BCMC is imperative for increases the chances of adopting the clinical messaging service.

The Clinical Quality/Pay-for-Value Administration Services would help the organization tremendously. Many group members believe it will improve the organization by collecting data that can be used to measure quality metrics. The providers who participate and perform successfully would receive incentives. This aligns well with programs such as Meaningful Use and will help providers avoid financial punishment for not abiding to health standards. All group members were excited about the \$175,000 this service would generate annually, and the only obstacle mentioned is making sure the organization has enough funding to implement it.

Your view of how RCHIE will be financially self-sustaining in the long run.

Everyone in the group believes it will take a long time for RCHIE to become self-sustainable. This is due to the annual fees for the services, as well as the high probability of unforeseen costs due to technical problems during or after implementation. Group members suggested to implement services in a stepwise fashion to prevent spending too much money on a potentially risky project. It may be beneficial to prioritize the services that will earn revenue during implementation.

Once the services are in place, it is important that patients begin receiving better care. Improvements in patient satisfaction are correlated with decreased costs related to miscommunication, increased time utilization, decreased adverse patient outcomes, and a reduction of provider and patient turnover (Yaraghi, 2015). An increase in the facilities' reputations will increase the board's chance of receiving more grant money, which will allow the project to continue to grow. It may be helpful for RCHIE to investigate other grants or loans. With these suggestions in mind, RCHIE has a great chance for success.

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Group 3

Building of infrastructure is very important for the rural HIE and loan from Federal agencies such as Agency for Health Research and Quality (AHRQ), Health Resource and Services Administration (HRSA), Healthcare Information Management Systems Society (HiMSS) and organizations such as RHI that offer loan and grant to support EHR implementation should be applied for by RCHIE. Also in order to reduce cost the use of cloud computing technology should be implemented for project such as Clinical Messaging Services and Clinical Information Repository Services. This recommendation is in line with (Stephanie & Sharma, 2016) that the cloud computational based technologies provided the health information to the various stakeholders for syndication, distribution, and aggregation, this results in reducing the costs and improves the efficiencies.

For sustainability of RCHIE non-profit HIE in the rural community, membership fees and stakeholders such as AZB , Payors is important because this can be used as operational expenses along with getting funds from other sources like Rural Economic Development Loan and Grant Program (Health Information Technology in Rural Healthcare, 2020), Rural Health Network Development Planning Program. This grant is also beneficial in developing services like e-prescribing and clinical information messaging tools and applications. It will help in the reduction of costs and achieve quality in health care being delivered by developing a new market in the implementation and adoption of telehealth technologies and their usage (Stephanie & Sharma, 2016). The e-prescribing services allow physicians to send prescriptions electronically directly to pharmacies. This information can help prevent medical errors for example, with e-prescribing there is no need to worry about the difficulty in understanding the physician's handwriting. Also, the annual membership would create financing of \$300,000 for RCHIE, which Menachemi (2018) described that health IT encourages the best type of health care provided by correlating better performances of the hospitals, thereby reducing costs of imaging, providing better public health.

Above all security and privacy should be give almost priority because according to Abdelhamid, Gaia, and Sanders (2017) privacy and safety are the main obstacles that are common in existence in the health IT field.

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Group 4

After going through my peer's discussion posts, we (Nishant Makhijani and Sri Saranya Ravi) summarized some recommendations which can be used in Rural Health Information Exchange (RCHIE) in case of reduced funding. The implementation of the Health Information Exchange (HIE) in RCHIE can enable the transfer of information with appropriate standards between healthcare providers and organizations (Menachemi et al., 2018). Almost everyone mentioned cloud storage technology, e-prescriptions and mobile health applications in their posts as a very cost-effective and novel approach towards healthcare delivery. Cloud computing technology is a very innovative approach especially when there is a tight budget and the best results are required. It can save expenses as it reduces the need for purchase for expensive software and systems required to store data ("Top 6 Benefits of Cloud Computing for Healthcare", 2020). Also, cloud technology has its resources which reduces the costs of purchase even more. The use of e-health and cloud storage has significantly increased which reduces the costs spent on electronic health records which usually pose an issue to many organizations (Sharma, 2016). Electronic prescriptions have been used nowadays widely in which healthcare providers prescribe medications electronically. It can be used effectively in the RCHIE organization especially to reduce costs. It reduces hospital readmissions in patients, callbacks from the pharmacy, medication errors and increased convenience ("How ePrescribing Could Save Billions in Health Care Costs", 2020). The reduction of medical errors has a huge positive impact on outcomes as well as also reduces the investments used to correct these errors. Mobile health applications are the next recommendation which can be used in less finance which can also help in achieving the best possible care. The healthcare provider and patient can contact each other and update via this application which is very convenient. It also reduces the need to physically go to clinics for routine purposes or for any questions. Through mobile applications, communication can be established even to remote areas where there is a barrier to travel. These approaches help to reduce costs along with effective healthcare delivery. Telecommunication technology in the form of virtual visits, teleconferencing, telemonitoring can also help in providing services to patients in rural areas who are deprived of healthcare. This can be used particularly in old age or disabled people who face difficulty in traveling to the hospital for routine checkups. Securing personal health records is also very important along with cost-effectiveness. Health care providers should also focus on the security and privacy aspects of health data as electronic data is prone to many risks (Abdelhamid et al., 2017). Also, in our opinion, Rural Economic Development Loan and Grant Program (REDL and REDG) can be adopted by the RCHIE organization to expand facilities with the received funding which can be used in development of the economy and initiation of projects ("Health Information Technology in Rural Healthcare – Funding & Opportunities - Rural Health Information Hub", 2020). We think with these recommendations the RCHIE organization can continue their proposed plan in reduced funding along with the best possible outcomes.

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