Schedule 13
Funding Request for the 2014-15 Budget Cycle

Department: Department of Human Services
Request Title: Mental Health Institutes Electronic Health Record System
Priority Number: R-11

Dept. Approval by: [signature] 10/24/13 Date

OSPB Approval by: [signature] 10/24/13 Date

- [x] Decision Item FY 2014-15
- [ ] Base Reduction Item FY 2014-15
- [ ] Supplemental FY 2013-14
- [ ] Budget Amendment FY 2014-15

Line Item Information		FY 2013-14		FY 2014-15		FY 2015-16
		1	2	3	4	5
	Fund	Appropriation FY 2013-14	Supplemental Request FY 2013-14	Base Request FY 2014-15	Funding Change Request FY 2014-15	Continuation Amount FY 2015-16
Total of All Line Items	**Total**	132,245,659	0	131,810,815	350,396	528,164
	FTE	1,171.8	0.0	1,172.4	4.5	7.7
	GF	98,910,112	0	98,809,852	350,396	528,164
	CF	10,168,925	0	10,168,925	0	0
	RF	16,891,170	0	16,556,586	0	0
	FF	6,275,452	0	6,275,452	0	0
	MCF	13,751,092	0	13,416,508	0	0
	MGF	6,875,546	0	6,708,255	0	0
	NGF	105,785,658	0	105,518,107	350,396	528,164
(1) Executive Director's Office, (A) General Administration, Health, Life and Dental	**Total**	29,147,559	0	28,949,229	22,105	35,368
	FTE	0.0	0.0	0.0	0.0	0.0
	GF	17,669,591	0	17,653,725	22,105	35,368
	CF	609,233	0	609,233	0	0
	RF	6,940,436	0	6,757,972	0	0
	FF	3,928,299	0	3,928,299	0	0
	MCF	6,789,076	0	6,606,612	0	0
	MGF	3,394,538	0	3,303,306	0	0
	NGF	21,064,129	0	20,957,031	22,105	35,368
(1) Executive Director's Office, (A) General Administration, Short-term Disability	**Total**	417,329	0	413,637	528	836
	FTE	0.0	0.0	0.0	0.0	0.0
	GF	259,563	0	259,268	528	836
	CF	9,412	0	9,412	0	0
	RF	85,167	0	81,770	0	0
	FF	63,187	0	63,187	0	0
	MCF	64,762	0	61,365	0	0
	MGF	32,381	0	30,683	0	0
	NGF	291,944	0	289,951	528	836
(1) Executive Director's Office, (A) General Administration, S.B. 04-257 Amortization Equalization Disbursement	**Total**	7,726,678	0	7,643,243	9,602	16,731
	FTE	0.0	0.0	0.0	0.0	0.0
	GF	4,724,604	0	4,717,929	9,602	16,731
	CF	179,431	0	179,431	0	0
	RF	1,622,310	0	1,545,550	0	0
	FF	1,200,333	0	1,200,333	0	0
	MCF	1,235,242	0	1,158,482	0	0
	MGF	617,621	0	579,241	0	0
	NGF	5,342,225	0	5,297,170	9,602	16,731

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(1) Executive Director's Office, (A) General Administration, S.B. 06-235 Supplemental Amortization Equalization Disbursement	Total	6,960,305	0	6,882,084	9,002	16,161
	FTE	0.0	0.0	0.0	0.0	0.0
	GF	4,250,101	0	4,243,843	9,002	16,161
	CF	161,986	0	161,986	0	0
	RF	1,464,585	0	1,392,622	0	0
	FF	1,083,633	0	1,083,633	0	0
	MCF	1,109,066	0	1,037,103	0	0
	MGF	554,533	0	518,552	0	0
	NGF	4,804,634	0	4,762,395	9,002	16,161
(8) Behavioral Health Services, (C) Mental Health Institutes, Mental Health Institute - Ft. Logan Personal Services	Total	18,074,275	0	18,084,529	46,210	91,589
	FTE	216.4	0.0	216.6	0.9	1.9
	GF	15,833,822	0	15,844,076	46,210	91,589
	CF	2,187,924	0	2,187,924	0	0
	RF	52,529	0	52,529	0	0
	FF	0	0	0	0	0
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	NGF	15,833,822	0	15,844,076	46,210	91,589
(8) Behavioral Health Services, (C) Mental Health Institutes, Mental Health Institute - Ft. Logan Operating Expenses	Total	1,080,718	0	1,058,112	7,865	8,815
	FTE	0.0	0.0	0.0	0.0	0.0
	GF	921,435	0	898,829	7,865	8,815
	CF	123,601	0	123,601	0	0
	RF	35,682	0	35,682	0	0
	FF	0	0	0	0	0
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(8) Behavioral Health Services, (C) Mental Health Institutes, Mental Health Institute - Pueblo Personal Services	Total	63,953,167	0	63,977,868	221,674	332,760
	FTE	955.4	0.0	955.8	3.6	5.8
	GF	51,238,570	0	51,263,271	221,674	332,760
	CF	6,493,976	0	6,493,976	0	0
	RF	6,220,621	0	6,220,621	0	0
	FF	0	0	0	0	0
	MCF	4,250,578	0	4,250,578	0	0
	MGF	2,125,289	0	2,125,289	0	0
	NGF	53,363,859	0	53,388,560	221,674	332,760
(8) Behavioral Health Services, (C) Mental Health Institutes, Mental Health Institute - Pueblo Operating Expenses	Total	4,885,628	0	4,802,113	33,410	25,904
	FTE	0.0	0.0	0.0	0.0	0.0
	GF	4,012,426	0	3,928,911	33,410	25,904
	CF	403,362	0	403,362	0	0
	RF	469,840	0	469,840	0	0
	FF	0	0	0	0	0
	MCF	302,368	0	302,368	0	0
	MGF	151,184	0	151,184	0	0
	NGF	4,163,610	0	4,080,095	33,410	25,904

Letternote Text Revision Required? Yes: ☐ No: ☑ **If yes, describe the Letternote Text Revision:**
Cash or Federal Fund Name and COFRS Fund Number: N/A
Reappropriated Funds Source, by Department and Line Item Name: N/A
Approval by OIT? Yes: ☐ No: ☐ **Not Required:** ☑
Schedule 13s from Affected Departments: N/A
Other Information: New line and additional funding in FY 2016-17.

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Approval by OIT? Yes: ☐ No: ☐ **Not Required:** ☑
Schedule 13s from Affected Departments: N/A
Other Information: New line and additional funding in FY 2016-17.

State of Colorado

Department of Human Services

FY 2014-15 Funding Request
November 1, 2013

John W. Hickenlooper
Governor

Reggie Bicha
Executive Director

Department Priority: R-11
Request Detail: Mental Health Institutes Electronic Health Record System

Summary of Incremental Funding Change for FY 2014-15	Total Funds	General Fund	FTE
Child Care Grants for Quality	$350,396	$350,396	4.5

Request Summary:

The Department requests $350,396 General Fund and 4.5 FTE in FY 2014-15; $528,164 General Fund and 7.7 FTE; and $2,734,592 General Fund and 8.0 FTE in FY 2016-17 and beyond to fund personal services, operating expenses and contractual services to support the Electronic Health Record (EHR) system.

Problem or Opportunity:

This request is the operating request that corresponds with the Department's capital request to purchase and implement an Electronic Health Record (EHR) at the Colorado Mental Health Institutes (Institutes). The capital request does not include funds to pay licensing fees, provide system hosting and support, ongoing development and enhancements to the system or add staff to conduct analysis, provide customer support and training, and support the applications. The Colorado Mental Health Institutes at Fort Logan (MHI-Fort Logan) and Pueblo (MHI-Pueblo) provide treatment for civil and forensic patients. The Institutes provide comprehensive psychiatric, psychological, rehabilitation and therapeutic care to individuals with serious mental illness.

The operating request will support the EHR's successful introduction and integration into the Operations of the Institutes. It will allow the fully integrated system to improve the accuracy of diagnoses, care coordination and harms health outcomes, impacting several C-Stat measures including the number of staff and patient injuries and seclusion and restraint incidents as well as the Department's goal "To promote quality and effective behavioral health practices to strengthen the health, resiliency and recovery of Coloradans".

Proposed Solution:

Companion Capital Construction Request

The Department has submitted a corresponding Capital Construction request to purchase and implement a modern, comprehensive, and fully-automated EHR that is fully integrated with all necessary clinical, operations and financial modules and systems and is compliant with meaningful-use requirements. The Institutes currently utilize a web-based dietary system (Vision's Carex system); legacy pharmacy (OPUS-ISM) and lab (Multidata) systems on local servers; a primary health information system (NetSmart's Avatar) on a local server for Admission/Discharge/Transfer (ADT), diagnostics, non-pharmacy billing, legal commitment records, some scheduling, seclusion and restraint, and medication variances; and multiple Microsoft Access databases for additional data capture and reporting.

The Capital Construction request is to implement a comprehensive solution that includes:

- An EHR, including, but not limited to, all modules and functions required to meet the current and pending meaningful-use standards (e.g., physician order entry, robust clinical decision support, assessments, care plans, discharge planning, patient portal, Health Information Exchange (HIE) interface, full integration with lab, pharmacy and dietary components, billing, financial analysis and reporting, regulatory compliance, behavior interventions, diagnostic and medical history and treatments, document storage and retrieval, scheduling, medication reconciliation, clinical notes, electronic Medication Administration Record (eMAR), record-level audit capability, etc.);

- Point of care documentation for active treatment and implementation of an individualized care plan;

- A system for historical records retention (e.g. 10 years) – archive systems that will comply with records management best practice; and

- A fully-hosted and web-based solution, wherein the EHR and the integrated systems reside securely off-site, without the need for OIT resources or support of application servers.

While the solution will be commercial off-the-shelf (COTS) software, all EHR products are designed as highly-interfaced modules that are augmented by "soft-coding" development tools, so that developers can make the many detailed modifications and enhancements that are necessary before the system can be fully operational. The request assumes that these modifications will be done by the software vendor, rather than by State FTE or contracted staff, and therefore includes these costs during the first two years in Capital Construction, and in the third and following years in this Operating request.

Operating Request

The Department's FY 2014-15 request includes personal services and operating expenses to oversee, analyze and support the application design and implementation. Additional personal services and operating expenses requested in FY 2015-16 will fund ongoing system modification/maintenance, data analysis and customer support. When the EHR systems is operational in FY 2016-17 and subsequent fiscal years, a total

of 8.0 FTE and additional funds will be needed for personal services, operating expenses and contractual programming, licensing and system hosting services to support the EHR. A general timeline for the hiring of staff and the implantation of their duties is shown in Attachment K.

FY 2014-15

The Department requests additional funds to hire five positions (4.5 FTE in the initial year, and 5.0 FTE in subsequent years), as defined below. Direct salary costs for the FTE in FY 2014-15 equal $267,884, with an additional $41,237 in benefits costs to the Executive Director's Office (EDO). Operating expenses per common policy of $28,265, plus additional travel costs of $13,010 between the two Institutes, equal $41,275. The total requested for FY 2014-15 is $350,396 and 4.5 FTE.

One General Professional V, Service Delivery Manager: the EHR Service Delivery Manager will oversee the presentation of the EHR as a service to internal and external users, while making sure the service levels are effective. This position provides a link between projects, program activities, and IT resources. The most vital aspect of service delivery is communication between program management and OIT with regard to program objectives, projects, application development, and resource constraints. In a continual service improvement model, the service delivery manager supervises the teamwork and liaises between the Department, OIT and vendor partners to ensure that the EHR functions effectively as a service. This position: oversees all lifecycle aspects of the EHR as an IT service; creates, monitors and re-negotiates Service Level Agreements in partnership with OIT to ensure quality services are delivered; translates program requirements into working instructions for the application development and support teams; mitigates and solves escalations; monitors detailed reports, including project status, application availability, release management (application enhancements or defect fixes), training activities, end-user support activities and budget expenditures; and manages the transition of program and procedural knowledge to maintenance and support teams.

One General Professional IV, Process Analyst: The current Institute analysts (2.0 FTE) provide the bulk of the operations and regulatory analyses related to Institute performance, including those for the Department's C-Stat efforts, drawing from the current health, staffing and budget systems. With the addition of the assessment, treatment, diagnostic, lab and dietary data presented by the new EHR, as well as improved access to pharmacy data, the potential for useful and impactful analyses will increase many times over. The Institutes will, for example, be able to measure the effectiveness of medications and treatment interventions by patient acuity / diagnoses / ages / medical conditions / lengths of stay; design performance improvement processes within and alongside the EHR; establish cost parameters for treatment modalities; improve direct-care staffing patterns; etc. These kinds of cost, operations and treatment-effectiveness analyses must be designed, built and modified as needed, and the current analytical staff are strained to meet the existing demand. Initially, the work of this position in the first year, and of another Process Analyst as a General Professional III in the second year, will be largely devoted to the writing of specifications for the customization of the EHR as it is implemented, and then enhanced (as the various ancillary clinical systems built in Microsoft Access are replaced by new functionality in the EHR). As the

EHR expands and matures, the two Process Analyst positions will shift their responsibilities from design support to analyses of clinical effectiveness and operations.

Three General Professionals III, Applications Support: The applications support function at the Institutes for the Avatar, lab, pharmacy and dietary systems is met currently through 2.5 FTE, who have the working titles of Avatar Coordinator. The Coordinators maintain system dictionaries, create and maintain user roles and security within the systems, develop specifications for system changes to be done by programmers, research system problems, reinforce data quality, run automated jobs to produce reports and data extracts for regulatory compliance, train staff in how to use the systems, test all system changes by vendors and programmers, and design work-process changes (so that the work of clinical and administrative staff, such as those in Nursing, Social Work, Psychology, Accounting, Admissions, and Medical Records, interfaces efficiently and effectively with the systems they use). The Coordinators are the hub of the work flow between the systems, the users, the information they need, and the resulting changes in work process and system design. As such, the Coordinators interface with staff throughout the clinical and administrative departments at the Institutes, and participate in numerous committees, both within the Institutes and with national, vendor-supported, system-user groups. The addition of clinical functions and interfaces within the EHR will multiply all of the factors above, including adding hundreds of more users. The modules for care planning, progress notes, decision support, assessments, discharge planning, electronic medication administration, etc., are each the equivalent of a substantial system itself, interfaced with all the other components of the EHR, and each requiring enhancement, security, testing, quality enforcement, and all the other aspects of system support and routine modification that are provided by the Coordinators. The three FTE requested will initially relieve the current Coordinators in maintaining the legacy systems as the experienced staff support the implementation and modification of the EHR, and will ultimately merge with the existing staffs to serve as the principal, daily support for the various modules and systems that comprise the EHR.

FY 2015-16

The Department is to hire three additional positions (2.7 FTE in the initial year, and 3.0 FTE in subsequent years), as defined below. The total salary costs for FTE in FY 2015-16 equal $424,349, with an additional $69,096 in benefits costs to the Executive Director's Office (EDO). Operating expenses per common policy of $21,709, plus additional travel costs of $13,010 between the two Institutes, equal $34,719. The total requested for FY 2014-15 is $528,164 and 7.7 FTE.

One General Professional III, Process Analyst: As described above for the Analyst requested for FY 2014-15, this second analyst will initially be focused upon supporting modifications during the installation and roll out of the EHR, and as the implementation is completed, will transition to analyses of clinical effectiveness and operations.

Two Technicians III, Customer Support: The recent and universal expansion of the use of EHRs has revealed key lessons in their implementation and maintenance, including the need for continued, hands-on

customer support. Consumer literature features warnings about implementation failures caused by a lack of sustained training and customer assistance after system roll out. Additionally, OBH staff interviewed a number of other state psychiatric hospitals that implemented EHRs, and all reported that the need to train new staff, retrain existing staff, reset passwords, reinforce the general concepts of what the parts of the system can do and how they work, and above all, help the hundreds of individual users personally at their workstations and in the treatment units (24/7), is paramount. This need for personal assistance was commonly reported as necessary to retain user engagement with the EHR, to not abate, and to consume one FTE per location or large hospital campus. Such information is consistent with the experience of current OBH support personnel, who daily assist all manner of staff with all aspects of health systems and general computer usage. The Department therefore requests one FTE for each of the Institutes for intensive customer support, is hopeful that this need could ultimately decrease, and should that happen, will repurpose these FTE to also train and support staff in all aspects of automation applications, such as Windows, Office, printers and scanners, and the various online resources that staff must access.

FY 2016-17

The Department is requesting the full implementation of the eight positions at 8.0 FTE, with costs of $438,427 for salaries, $73,747 in benefits in the EDO budget line, $13,010 in intra-state travel between the Institutes, $15,700 in Common Policy staff-related operating expense, $42,693 in ongoing expenses for leased equipment, and $2,151,015 in ongoing software vendor costs (these last two expenses are explained below). The total requested funds for FY 2016-17, inclusive of all FTE, operating and vendor costs is $2,734,592.

A timeline depicting the rollout of the FTE is shown on Attachment I. The current and proposed staffing is shown in Attachment J.

FTE Benchmarking

The Department has benchmarked its FTE request against the average FTE used by five other State psychiatric hospitals that are implementing EHRs, the FTE recommended by a leading EHR vendor, and to an average FTE ratio suggested by a study of national health IT staffing.[1] Because the requested FTE includes staffing only for customer support, EHR management, analysis, and system modification meant to be done by local, non-programmers, all FTE in the comparisons exclude network, desktop, programming, and any other resources not attributable to the direct maintenance and operation of the EHR systems. The details for these comparisons are shown in Attachment K.

The Department's staffing to support the requested solution (i.e., a fully-hosted, cloud-based EHR with all programming provided by the vendor) is housed in the Information Management (IM) unit of the Mental Health Institutes Division of the Office of Behavioral Health. The IM unit currently has 10.8 FTE, of which 7.3 are currently devoted to providing similar types of support for the Institutes' current health

[1] American Medical Informatics Association, 2008 AMIA Symposium, *What Workforce is Needed to Implement the Health Information Technology Agenda? Analysis from the HIMSS Analytics Database,* William Hersh, MD and Adam Wright, PhD

systems. The requested 8.0 FTE would bring the total FTE for customer, analytical and application support to 15.3 FTE, or a ratio of 0.028 support FTE per hospital bed, a level that is lower than most comparable institutions.

One of the vendors that responded to the Department's Request for Information (RFI) regarding EHR systems is Siemens. Their product is Soarian, a well-integrated EHR with the features and hosting capabilities requested by the Department. Based upon the Institutes' number of inpatient beds, the scenario of using a hosted solution and vendor programming, and their knowledge of the resources required to successfully operate their product to its desired potential, the Siemens implementation expert estimated a post-implementation requirement of approximately 18.3 FTE, or 0.033 FTE per bed. This amount is 3.0 FTE greater than the Department's request.

The Department requested the same information from several other State-operated psychiatric hospitals that are implementing EHR systems, and received responses from five (Texas, Oregon, Utah, Alaska and Idaho). These hospitals are in varying stages of post-implementation enhancement of their EHR systems. Again, programming, network, desktop and any other IT FTE not directly related to operating, managing, analysis, and enhancing the EHR were removed from the comparison. The average of the direct EHR management, data analysis, informatics, and customer support staff was also 0.033 FTE per inpatient bed, or 3.0 FTE above the Department's request. Of the two hospital systems that operate their EHR systems at an FTE-per-bed ratio lower than the requested 0.028, Texas (at 0.024) achieves a more efficient utilization of its centralized resources by virtue of its 2,300 beds (more than four times the number for the Colorado Institutes), and Utah (at 0.018) built and operates its own EHR system through programming staffs, with nearly no application support staff between the skill levels of programmer and help desk - their operations approach is unusually programmer-reliant, so the removal of programmers from their FTE comparison creates an atypical ratio.

In 2008, the American Medical Informatics Association's (AMIA) study of health IT resources drawn from Healthcare Information and Management Systems Society's (HIMSS) Analytics Database of national health IT data found the "overall IT staffing ratio to be 0.142 IT FTE per hospital bed." The Department's analysis of this data removed the shares of FTE categorized as programmers, network administration, security, and PC support, which accounted for 50% of the IT staffing, and further reduced the remaining components (management, operations, and project management by one-third, help desk by one-half, and "other" by three-quarters) to establish a very conservative estimate of the remaining FTE that would be supporting the direct operation of a hospital's most significant and staff-intensive IT resource, the EHR. That adjusted national average ratio is 0.038 IT FTE per hospital bed (or equal to 20.8 FTE, or 5.5 FTE above the FTE requested when applied to the Colorado Mental Health Institutes' 545 beds).

Leased equipment: The request includes electronic tablets to be used by physicians and other clinicians (to allow real-time order entry, chart updating, and medical information access while conducting groups and interacting with patients), as well as bar code scanning and labeling equipment to interface with the

pharmacy and EHR system and eliminate medication transcription errors. The tablets will have docking stations with full monitors, mice and keyboards, and while being used by clinicians for patient assessments, monitoring, and charting, will access the EHR via the secure, wireless access network included in the Capital Construction requested.

Software vendor costs: The solution sought in the Capital Construction request is for a fully-hosted and programming-supported vendor system that meets all federal guidelines set forth by the Department of Health and Human Services and specified by the ARRA legislation. The solution will require no server, programming or other support by OIT resources, and only the standard, local application support described above for the requested FTE (i.e., routine maintenance, dictionary and security support, user specification development and testing, training, and simple, non-programming changes done through vendor-supplied tools meant for local use). The annual vendor costs for hosting the EHR and for software licenses is estimated to be $1,091,930. However, this expense is offset by no longer operating the legacy systems and their related servers (an annual savings of $377,787). Therefore, the net requested funds for ongoing system hosting and software licenses are $714,143.

Also, while the solution will be commercial off-the-shelf (COTS) software, all EHR products are designed as highly-interfaced modules that are augmented by "soft-coding" development tools, so that developers can make the many detailed modifications and enhancements that are necessary through the life of the system. As hospital procedures and regulatory requirements are constantly evolving, EHR systems must be adapted quickly and more frequently than most other large software applications (such as systems that support routine office functions or standardized payment/inventory protocols). The request includes funds for these ongoing modifications to be done by the software vendor, rather than by State FTE or contracted staff. Given the expected frequency and likely complexity of the modifications, and the need to maintain the new wireless network on both Institute campuses, the annual vendor expense for this additional programming and wireless network support reflects the higher end of OIT's estimation-range for ongoing software support by vendors, and consistent with OIT's experience with other high-maintenance systems, is estimated at 20% of the initial purchase and installation cost for the EHR software and wireless network, or $1,436,872.

Anticipated Outcomes:

Funding the operational support for an EHR will improve clinical efficiency and patient safety; provide new safeguards in pharmaceutical prescribing, dispensing and administration practices; expand the use of clinical outcomes and operations data by Institute managers; and address the findings and recommendations of the State audit. Within two years following completed implementation of the new EHR system, and with the funded support of ongoing vendor, operations and FTE costs, the Institutes will:

- Order, dispense and administer medications through an automated, bar-coded process that eliminates order transcription and reduces medication errors to near zero;

- Drive patient care from treatment plans that are: automatically constructed from electronic assessments, diagnoses, and physician orders; implemented through scheduled medications, groups, individual therapies, and all other treatments; monitored via records that capture the delivery of all treatments and the ongoing acuity of each patient; and evaluated by a graphic display of the patient's improvement over time and the recorded achievement of treatment goals;

- Provide clinicians with quick and simple access to lists of patients on high-alert (or any specific) medications, relevant information about their allergies, lab results, and diets;

- Be replacing (or will have replaced) in the EHR the various ancillary Microsoft Access databases that were built to augment the collection of patient data in the legacy systems;

- Be analyzing the realm of new clinical data to evaluate the effectiveness of medications and treatments;

- Provide physicians and other clinicians with automated decision-support logic within the EHR (for example, an order entered for a high-risk medication will instantly check the pharmacy module for a history of allergies or contra-indications, and also check the lab for a corresponding test, and alert the physician if a new test is needed, or if the last result indicates that the medication is not appropriate (or another might be), or if there are allergies, drug-to-drug interactions, or a patient history that might rule out that medication);

- Allow users to easily see all the clinical information they need for a patient, in a display that is intuitive and useful for clinical decision making, but limit the users to only the information that is medically appropriate and necessary;

- Provide for the secure release and acceptance of patient records between the Institutes, other providers, and the patients themselves; and

- Capture and process all psychiatric, medical, legal, administrative, billing and other relevant data in a unified, integrated system that is intuitive, provides useful information quickly and easily, completely replaces the paper medical record, is embraced by the hundreds of users, and improves patient safety and operating efficiency.

Assumptions and Calculations:

A summary of the roll up of all requested funds to budget lines per fiscal year is shown in Attachment A.

Software purchase and installation costs	Cost estimates for the EHR purchase, installation and maintenance are based upon amounts submitted by vendors in response to a published Request For Information (RFI). The estimates represent the midpoint between a well-integrated EHR solution with lowest annual cost (the most effective category of EHR at the lowest long-term cost) and a well-integrated EHR solution with next highest long-term cost. This approach establishes sufficient funding to implement a successful solution based upon the low-end of acceptable products while accounting for the unknown factors that cannot be addressed in an RFI for a large-scale automation project. The vendor features and costs identified through the RFI are included in Attachment F. This calculation is included only for determining the annual vendor support costs.
Additional vendor development and wireless maintenance costs	Robust and well-integrated health information systems are: a) built around core functions that cannot be modified by purchasers, and b) include development tools that provide for soft-coding modifications and enhancements The $1,436,872 annual cost for required vendor enhancement represents 20% of the cost to purchase and install the EHR software and the wireless network. As an ongoing operating expense, this amount would vary from year to year, based upon the solution implemented and the need for complex enhancements. Details are shown in Attachment F.
Computers and supporting peripherals	These estimates are based upon the current lease costs through the Governor's Office of Information Technology vendor, Hewlett Packard. The number per unit and location are included in Attachment E.
Bar Code Label and Scanning Equipment	These estimates are based upon current market rates determined via internet search, and the number required for the Mental Health Institute pharmacies, clinics and treatment units. The number per unit and location are included in Attachment E.
Wireless Network	These estimates were provided by OIT and their wireless vendor and are based upon the square footage and construction of the floors that require wireless connectivity for timely access to the electronic medical information. The costs reflect a 20% increase for construction, wiring and establishing power for the wireless system. The floors and buildings identified for wireless communication are included in the Attachment H. This calculation is included only for determining the annual vendor support costs.
Software Vendor Savings	These assume the discontinuance of paying for the projected expenses for the current dietary, lab, pharmacy and primary health information system licenses, vendor support fees, and server costs once the project is fully operational in FY 2016-17. Details are shown in Attachment G.
FTE Salaries, Benefits and Related Operating	These reflect the minimum of the salary range for each job class listed in the DPA Compensation Plan for FY 2013-14. Costs for supporting operating per FTE are per Common Policy. Details for CMHIFL and CMHIFP are in Attachments B and C, respectively.
Travel	Assumed is four staff traveling once a month overnight between Denver and Pueblo for meetings to plan and coordinate system enhancements and to prepare and present analytical findings. This is a modest increase over the currently unfunded travel by one to three staff per month in performing these same functions based upon the legacy systems. The mileage and per diem

	rates are per DPA guidelines, and the hotel costs reflect recent rates. Details are shown in Attachment D.
Comparison to National Average EHR FTE	The initial ratio of 0.142 Health IT per hospital bed is first reduced by 50%, as the AMIA workforce study identified 50% of the total FTE as those that would not be staffing an EHR in the request (excluded categories are programming, security, PC support and network administration). While the remaining categories (management, project management, help desk, operations, and "other" (which could include informatics, training, and analysis) typically are overwhelmingly devoted to direct EHR operation, these FTE categories are further reduced by between one-third and three-quarters to ensure a conservative estimate that does not overstate the FTE requirement. Details are shown in Attachment K.

The request assumes that there will be no FTE savings from implementing an integrated EHR. The efficiencies gained through implementing an EHR are primarily in time savings for physicians and clinicians in performing regular tasks and in receiving information more quickly, such as: writing and transmitting orders, receiving lab results, accessing transcribed assessments and reports, filling out electronic assessments, populating the care plan, scheduling patient therapies, updating the medication administration record, accessing the chart from anywhere on campus, not having to photo copy papers and add them into the chart, etc. These time savings allow doctors and clinical staff to spend more time in patient care, which is highly desirable and one of the purposes for implementing a full EHR. The Institutes do not envision any reductions in direct-care staff resulting from the EHR, as the current staffing levels must be maintained for safety, the quality of care, and regulatory compliance.

Also, the non-direct-care FTE that support the current paper chart either have other critical duties that must still be accomplished, or will perform similar tasks within the new EHR. Specifically, the staff that perform miscellaneous copying and chart updating on the units will have more time for their primary team-support duties, such as obtaining supplies, running errands, scheduling, coordinating non-clinical activities, and otherwise helping the Nursing staff and treatment team leaders. Similarly, the staff that perform medical coding, collect and enter legal information, and ensure that the chart is complete and accurate will still be required for those functions. However, they will have more services to code and more information to verify and follow up on. Therefore, the Institutes do not expect a reduction in these resources, either.

This continued need for supporting and clinical resources is consistent with the anecdotal information provided by the other state hospitals interviewed, none of which reported a reduction in FTE or significant resources. The efficiencies provided by an EHR result in improved care, patient safety, and information, but do not translate into cost reductions (aside from a marginal savings due to decreased use of paper, copying and binders).

Cost and FTE

- The Department requests $350,396 General Fund and 4.5 FTE in FY 2014-15; $528,164 General Fund and 7.7 FTE; and $2,734,592 General Fund and 8.0 FTE in FY 2016-17 and beyond to fund personal services, operating expenses and contractual services to support the Electronic Health Record (EHR) system.

Current Program

- The current legacy health and billing, laboratory, pharmacy, and dietary systems are used by both Institutes to track and bill for patient care. The health and billing system (Avatar) includes patient demographic information; date of admission, transfer or release; diagnosis and treatment; legal status; seclusion and restraint data, and payer information. Lab equipment is directly linked to the laboratory system (Multidata Lab) that stores clinical results and transmits billing information to Avatar. The dietary system (Carex) is used to plan and provide patient meals and includes dietary restrictions and preferences and food inventories. Meals are included and billed in the room rate through Avatar. Pharmacy orders are transcribed and entered in the pharmacy system (OPUS-ISM) in order to dispense medications and bill patients for pharmaceuticals.

Problem or Opportunity

- Patient demographics, medical history, diagnoses, treatment, laboratory and test results, medications, administrative and billing data are currently recorded in four distinct systems and, with the exception of lab results and demographic information received from Avatar, entered manually.
- Medication errors at the Institutes are twice the national average due to transcription errors.
- Accuracy of diagnoses, improved care coordination and health outcomes will impact several C-Stat measures including the number of staff and patient injuries and seclusion and restraint incidents as well as the Department's goal "To promote quality and effective behavioral health practices to strengthen the health, resiliency and recovery of Coloradans."

Consequences of Problem

- It is anticipated that the high rate of medication errors will continue and pose a risk to patient health and safety. The Institutes will lack the clinical decision support available in a fully integrated system.

Proposed Solution

- The Department is requesting capital funding to purchase an EHR system for the Institutes.
- FY15 funding requested includes personal services and operating expenses to oversee, analyze and support the application design and implementation. Additional personal services and operating expenses requested in FY16 will fund ongoing system modification/maintenance, data analysis and customer support. $583,577 and 8.0 FTE for personal services and operating expenses; $2,151,014 ($1,091,930 for license fees, system hosting and customer support, and $1,436,872 for development and enhancement less $377,788 in savings by eliminating the legacy systems) is requested in FY17.

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Attachment A - LONG BILL SECTION	FTE	FY 2014-15	FTE	FY 2015-16	FTE	FY 2016-17
(1) Executive Director's Office (A) General Administration						
Health, Life & Dental		$ 22,105		$ 35,368		$ 35,368
Short-term Disability		$ 528		$ 836		$ 864
AED		$ 9,602		$ 16,731		$ 18,856
SAED		$ 9,002		$ 16,161		$ 18,659
Shift Differential		$ -		$ -		$ -
SUB-TOTAL Executive Director's Office		**$ 41,237**		**$ 69,096**		**$ 73,747**
(2) Office of Information Technology Services						
(New Line) Electronic Health Records, Vendor Costs (Ongoing Fees, System Hosting and Support)		$ -		$ -		$ 1,091,930
(New Line) Electronic Health Records, Vendor Costs (Ongoing Development and Enhancement)		$ -		$ -		$ 1,436,872
Health Information Management System		$ -		$ -		$ (377,787)
SUBTOTAL Office of Information Technology Services						**$ 2,151,015**
(8) Behavioral Health Services (C) Mental Health Institutes						
Mental Health Institute - Ft Logan Personal Services (New Line)	0.9	$ 46,210	1.9	$ 91,589	2.0	$ 96,061
Mental Health Institute - Ft Logan Operating Expenses (New Line)		$ 7,865		$ 8,815		$ 12,831
SUBTOTAL Mental Health Institutes - Ft Logan		**$ 54,075**		**$ 100,404**		**$ 108,892**
Mental Health Institute - Pueblo Personal Services (New Line)	3.6	$ 221,674	5.8	$ 332,760	6.0	$ 342,366
Mental Health Institute - Pueblo Operating Expenses (New Line)		$ 33,410		$ 25,904		$ 58,572
SUBTOTAL Mental Health Institutes - Pueblo		**$ 255,084**		**$ 358,664**		**$ 400,938**
TOTAL Request by Long Bill Line Item	**4.5**	**$ 350,396**	**7.7**	**$ 528,164**	**8.0**	**$ 2,734,592**

Attachment B: MHI-Fort Logan FTE

Calculation Assumptions:

Personal Services -- Based on the Department of Personnel and Administration's August 2011 Annual Compensation Survey Report, a GP III, IV and IV and Technician III at the BOTTOM of the pay range will require a monthly salary of $3,834, $4,764 and $5,960, and $3,339

Operating Expenses -- Base operating expenses are included per FTE for $500 per year. In addition, for regular FTE, annual telephone costs assume base charges of $450 per year.

Standard Capital Purchases -- Each additional employee necessitates the purchase of a Personal Computer ($900), Office Suite Software ($330), and office furniture ($3,473).

General Fund FTE -- New full-time General Fund positions are reflected in FY 2012-13 as 0.9166 FTE to account for the pay-date shift.

Expenditure Detail--CMHIFL		FY 2014-15		FY 2015-16		FY 2016-17	
Personal Services:		FTE		FTE		FTE	
	Monthly Salary						
General Professional III	$ 3,834	0.9	41,407	1.0	46,008	1.0	46,008
PERA			4,203		4,670		4,670
AED			1,656		2,024		2,208
SAED			1,553		1,955		2,185
Medicare			600		667		667
STD			91		101		101
Health-Life-Dental			4,421		4,421		4,421
Subtotal Position 1, 1.0 FTE		0.9	**$ 53,931**	1.0	**$ 59,846**	1.0	**$ 60,260**
	Monthly Salary						
Technician III	$ 3,339	-	-	0.9	36,061	1.0	40,068
PERA			-		3,660		4,067
AED			-		1,587		1,923
SAED			-		1,533		1,903
Medicare			-		523		581
STD			-		79		88
Health-Life-Dental			-		4,421		4,421
Subtotal Position 2, 1.0 FTE		-	**$ -**	0.9	**$ 47,864**	1.0	**$ 53,051**
Subtotal Personal Services		0.9	**$ 53,931**	1.9	**$ 107,710**	2.0	**$ 113,311**
Operating Expenses							
Regular FTE Operating	500	1.0	500	2.0	1,000	2.0	1,000
Telephone Expenses	450	1.0	450	2.0	900	2.0	900
PC, One-Time	1,230	1.0	1,230	1.0	1,230		-
Office Furniture, One-Time	3,473	1.0	3,473	1.0	3,473		-
Travel			2,212		2,212		2,212
IT Devices			-				8,719
Subtotal Operating Expenses			**$ 7,865**		**$ 8,815**		**$ 12,831**
TOTAL REQUEST		0.9	**$ 61,796**	1.9	**$ 116,525**	2.0	**$ 126,142**
General Fund:			*$ 61,796*		*116,525*		$ 126,142
Cash funds:							
Reappropriated Funds:							
Federal Funds:							

Attachment C: MHI-Pueblo FTE

Calculation Assumptions:

Personal Services -- Based on the Department of Personnel and Administration's August 2011 Annual Compensation Survey Report, a GP III, IV and IV and Technician III at the BOTTOM of the pay range will require a monthly salary of $3,834, $4,764 and $5,960, and $3,339

Operating Expenses -- Base operating expenses are included per FTE for $500 per year. In addition, for regular FTE, annual telephone costs assume base charges of $450 per year.

Standard Capital Purchases -- Each additional employee necessitates the purchase of a Personal Computer ($900), Office Suite Software ($330), and office furniture ($3,473).

General Fund FTE -- New full-time General Fund positions are reflected in FY 2012-13 as 0.9166 FTE to account for the pay-date shift.

Expenditure Detail---CMHIP		FY 2014-15		FY 2015-16		FY 2016-17	
Personal Services:		FTE	$	FTE		FTE	
	Monthly Salary						
General Professional III	$ 3,834	1.8	82,814	2.9	133,423	3.0	138,024
PERA			8,406		13,542		14,009
AED			3,313		5,871		6,625
SAED			3,106		5,670		6,556
Medicare			1,201		1,935		2,001
STD			182		294		304
Health-Life-Dental			8,842		13,263		13,263
Subtotal Position 1, 3.0 FTE		1.8	**$ 107,864**	2.9	**$ 173,998**	3.0	**$ 180,782**
	Monthly Salary						
General Professional IV	$ 4,764	0.9	51,451	1.0	57,168	1.0	57,168
PERA			5,222		5,803		5,803
AED			2,058		2,515		2,744
SAED			1,929		2,430		2,715
Medicare			746		829		829
STD			113		126		126
Health-Life-Dental			4,421		4,421		4,421
Subtotal Position 2, 1.0 FTE		0.9	**$ 65,940**	1.0	**$ 73,292**	1.0	**$ 73,806**
	Monthly Salary						
General Professional V	$ 5,960	0.9	64,368	1.0	71,520	1.0	71,520
PERA			6,533		7,259		7,259
AED			2,575		3,147		3,433
SAED			2,414		3,040		3,397
Medicare			933		1,037		1,037
STD			142		157		157
Health-Life-Dental			4,421		4,421		4,421
Subtotal Position 3, 1.0 FTE		0.9	**$ 81,386**	1.0	**$ 90,581**	1.0	**$ 91,224**
	Monthly Salary						
Technician III	$ 3,339	-	-	0.9	36,061	1.0	40,068
PERA			-		3,660		4,067
AED			-		1,587		1,923
SAED			-		1,533		1,903
Medicare			-		523		581
STD			-		79		88
Health-Life-Dental			-		4,421		4,421
Subtotal Position 3, 1.0 FTE		-	**$ -**	0.9	**$ 47,864**	1.0	**$ 53,051**
Subtotal Personal Services		3.6	**$ 255,190**	5.8	**$ 385,735**	6.0	**$ 398,863**

Operating Expenses							
Regular FTE Operating	500	4.0	2,000	6.0	3,000	6.0	3,000
Telephone Expenses	450	4.0	1,800	6.0	2,700	6.0	10,800
PC, One-Time	1,230	4.0	4,920	2.0	2,460		
Office Furniture, One-Time	3,473	4.0	13,892	2.0	6,946		
Travel			10,798		10,798		10,798
IT Devices			-				33,974
Subtotal Operating Expenses			**$ 33,410**		**$ 25,904**		**$ 58,572**
TOTAL REQUEST		3.6	**$ 288,600**	5.8	**$ 411,640**	6.0	**$ 457,435**
General Fund:			*$ 288,600*		*411,640*		$ 457,435
Cash funds:							
Reappropriated Funds:							
Federal Funds:							

Attachment D: Travel							
	#/Month	**Est. Per Diem**	**Hotel**	**Miles**	**Rate**	**Mileage**	**Annual**
Travel	4	$ 82.00	$ 85.00	204	$ 0.51	$ 104.04	**$13,010**

Attachment E: Infrastructure Upgrade

Pueblo Units	Leased tablets	Leased monitors, keyboards, mice	Leased docking stations	Leased Bar Code Printers	Leased Bar Code Readers
LAU	5	5	5		1
A67	5	5	5		1
CORE	5	5	5		1
Circle	2	2	2		1
GW1	3	3	3		1
GW7	3	3	3		1
C1	4	4	4		1
C2	4	4	4		1
E1	4	4	4		1
E2/E3	4	4	4		1
F1	4	4	4		1
J1	4	4	4		1
REACH	4	4	4		1
L1	4	4	4		1
STAR	3	3	3		1
SLP	4	4	4		1
CRU North	2	2	2		1
CRU South	2	2	2		1
ACBU	2	2	2		1
Cottage	1	1	1		1
Physical Therapy	1	1	1		
Clinics	2	2	2		2
Dental Clinic	1	1	1		
Physicians	46	46	46		
Pharmacies				6	2
Lab				1	1
Number	**119**	**119**	**119**	**7**	**25**
cost per	$ 658	$ 80	$ 70	$ 108	$ 200
Total cost	**$ 78,281**	**$ 9,552**	**$ 8,330**	**$ 758**	**$ 5,000**
Total Equipment Costs	**$ 101,921**				
Ongoing annual costs	**$ 33,974**	Annualized cost for tablets, docking stations, monitors,			

Ft Logan Units	Leased tablets	Leased monitors, keyboards, mice	Leased docking stations	Leased Bar Code Printers	Leased Bar Code Readers
Team 1	4	4	5		1
Team 2	4	4	5		1
Team 3	4	4	5		1
Team 5	4	4	5		1
Clinic	1	1	1	1	1
Physicians	13	13	13		
Pharmacy				3	1
Number	**30**	**30**	**34**	**4**	**6**
cost per	$ 658	$ 80	$ 70	$ 108	$ 200
Total cost	**$ 19,735**	**$ 2,408**	**$ 2,380**	**$ 433**	**$ 1,200**
Total Equipment Costs	**$ 26,156**				
Ongoing annual costs	**$ 8,719**	Annualized cost for tablets, docking stations, monitors,			

Total MHI Annualized Equipment Costs	**$ 42,692**

Attachment F
MHI Electronic Health Record, Software and Hosting Costs
(unhide rows and columns to view details)

Vendor	Full 1stYr$ with Added Systems	Full 2ndYr$ with Added Systems	Full Annual$ with Added Systems
midpoint between best integrated with lowest annual cost (VersaSuite) and best integrated with next highest cost (Siemens)	**$6,068,365**	**$1,091,930**	**$1,091,930**

replacement Pharm	purchase	annual
RxConnect	$200,000	$5,000
WinPharm	$272,730	$78,346
avg	*$236,365*	*$41,673*

replacement Lab	purchase	annual
Orchard	$155,440	$18,653

replacement Dietary	purchase	annual	
Computrition	$230,000	$60,000	*annual based on Vision, current vendor*

Assumed HL-7 initiation cost per replacement system	$30,000	$6,000	*2-way HL-7 costs*

Additional Vendor Training Days	Per Day	Total
60	$1,200	**$72,000**

Ongoing Vendor Development Support	20% of software purchase and install, plus wireless	$7,184,359	**$1,436,872**

Attachment G: Annual Vendor Savings	SFY2017 Amount
Opus-ISM (Pharmacy)	($56,532)
Vision Carex (Dietary)	($64,651)
MultiData (Lab)	($64,476)
NetSmart (Avatar)	($174,639)
HP Server Support	($1,500)
VMWare Charges	($6,457)
Avatar Backups	($1,532)
2 Servers every 3 years	
Cost per server	($12,000)
Cost per year	($8,000)
Total	**($377,787)**

Attachment H - Wireless

CMHIFL BUILDINGS	total sq ft coverage = 251,650; total bldgs = 8; total floors = 14	all floors have concrete/rebar separation

$ 345,635 *MSN Communications*

20% *ancillary construction and wiring costs*

$ 414,762 Total CMHIFL

CMHIP BUILDINGS	total sq ft coverage = 652,802; total bldgs = 16; total floors = 30	all floors have concrete/rebar separation

$ 584,360 *MSN Communications*

20% *ancillary construction and wiring costs*

$ 701,232 Total CMHIP

$ 1,115,994 Total Cost both MHIs for Wireless

Attachment I - Timeline

IM EHR FTE	FY 2013-14				FY 2014-15				FY 2015-16				FY 2016-17			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Customer Support	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
EHR Management					1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Analysis	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Applications Support	4.8	4.8	4.8	4.8	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
Total	7.3	7.3	7.3	7.3	12.8	12.8	12.8	12.8	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3

Customer support is met through FTE intended for App support. EHR management occurs ad hoc from the analysis FTE. Analysis covers management, MHI key performance indicators and ad hoc data requests. App support does some regulatory reporting, maintains main systems, and builds and operates ancillary MS Access systems.

Business requirements construction, led by IM and involving all clinical and administrative functions of the Institutes.

Pre-work to hire Cap. Con. consultants, GP V, GP IV, and

Initial install in test of 1st parts of solution (ADT, billing & pharm 1st), new App staff learn business & assume customer support, existing staff work with vendor on specs, EHR Mgr and GP IV analyst learn

EHR Mgr overseeing daily IM aspects of install with PM and APM, new App staff and Analyst testing, training users, helping with specs and simple changes, existing App staff updating logic engine, changing

Customer support Techs hired and trained by App staff, GP III Analyst hired and learns business. Many EHR components installed and in production, others in test.

Customer support Techs assume all training and support, Analysis and App staff updating logic engine, App team testing and "spec"ing with vendor and changing

Installation complete. EHR Mgr coordinates change control and system delivery between IM, Institutes and vendor. Techs provide continuous support. App staff & Analysts suggest and create simple changes, coordinate others with vendor through EHR Mgr. Analysts extracting & creating analyses to optimize clinical outcomes and operations. Constant change due to clinical, operations & regulatory inputs reflected in constant modification and enhancement.

Attachment J - Informatics FTE

Current MHI Information Management (IM) FTE	Beds	Customer Support	Application Support	Analysis	EHR Mgmnt	FTE	FTE per Bed	Non-EHR FTE (data entry, admin, network access, other systems, etc.)
GP II			0.75			0.75		0.25
GP III		0.25	1.75			2.00		1.00
GP IV		0.25	0.95	1.20		2.40		
GP V			0.90			0.90		0.10
GP VI				0.80		0.80		0.20
IT II			0.40			0.40		
Tech III						0.00		2.00
FTE for EHR Support	545	0.5	4.8	2.0	0.0	7.3	**0.013**	3.6
Total Current IM FTE								10.8

Current Plus Requested FTE		Customer Support	Application Support	Analysis	EHR Mgmnt	FTE		
GP II			0.75			0.75		0.25
GP III			5.00	1.00		6.00		1.00
GP IV			1.20	2.20		3.40		
GP V			0.90		1.00	1.90		0.10
GP VI				0.80		0.80		0.20
IT II			0.40			0.40		
Tech III		2.00				2.00		2.00
FTE for EHR Support	545	2.0	8.3	4.0	1.0	15.3	**0.028**	3.6
Total Proposed IM FTE								18.8

Attachment K - EHR IT Staffing Study
From HIMSS Database Study, 2008 AMIA Symposium

Health IT Categories Supporting EHR in Hosted Cloud	Pct of IT FTE	Adustment	Adjusted Pct of IT FTE
Operations	8.0%	67.0%	5.4%
Management	11.0%	67.0%	7.4%
Project Management	1.0%	67.0%	0.7%
Other/Informaticists	22.0%	25.0%	5.5%
Help Desk	8.0%	50.0%	8.0%
Total EHR Directly Related, less Programming	50.0%		26.9%
Other Health IT Categories			
Programming	29.0%		
Network Administration	9.0%		
PC Support	11.0%		
Security	1.0%		
	50.0%		
Average Health IT FTE per Bed, Hospitals with EHRs	0.142		
Adjusted Health IT FTE per Bed, less Possible non-EHR FTE	**0.038**	(26.9% * 0.142)	

American Medical Informatics Association (AMIA)

Comparable EHR IT FTE to Beds Ratios

State Hospitals	Beds	Customer Support	Application Support	Analysis	EHR Mgmnt	FTE	FTE per Bed	Avg 5 State Hospitals
Alaska	80	2.0	2.0	1.0		5.0	0.063	**0.033**
Texas	2300	45.0	4.5	5.0	1.0	55.5	0.024	
Idaho	190	2.0	2.0	2.0		6.0	0.032	
Oregon	630	2.0	9.0	7.0	1.0	19.0	0.030	
Utah	329	2.0	2.0	1.0	1.0	6.0	0.018	
HIMSS Data							**0.038**	
Vendor Estimate for MHIs	545	2.0	10.3	5.0	1.0	18.3	**0.033**	