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School Nurse Program Evaluation

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JCPS SCHOOL NURSE DATA REVIEW (2014-2015)

INTRODUCTION

This report reviews school nurse data from the 2014-15 school year. Full reports covering 2011-2015 are available from the JCPS Data Management, Planning, and Program Evaluation Department. In a review of the research on student health and learning, Basch (2010) provides evidence that the academic success of today's children is strongly linked to their health. Health-related factors such as hunger, physical and emotional abuse, and chronic illness can lead to poor school performance. Health-risk behaviors such as substance use, violence, and physical inactivity are consistently linked to academic failure and often affect students' school attendance, grades, test scores, and ability to pay attention in class. Vision, asthma, teen pregnancy, aggression and violence, physical activity, breakfast, inattention and hyperactivity were identified by Basch (2010) as high priority health concerns that have educational implications. Health equity is an issue for JCPS students since many of these conditions, such as asthma, are more prevalent with lower socio-economic status (SES) populations. The current rate of free/reduced lunch, a proxy for SES, for JCPS students is 66%.

The National Association of School Nurses (NASN, 2006) recommends a student to nurse ratio of 750:1 in a regular student population. Jefferson County Public Schools (JCPS) like many school districts nationwide, does not come close to meeting that recommended ratio. However, in the 2007-2008 school year, JCPS took steps toward meeting the NASN recommendation in a set of high need elementary schools. Three Advanced Registered Nurse Practitioners (ARNPs) were hired and assigned to seven JCPS elementary schools for the 2007-2008 school year. School nurse major responsibilities are as follows:

- Provide unscheduled onsite health room visit services to students
- Administer scheduled medications to students
- Provide student and staff health trainings
- Improve immunization and physicals compliance
- Maintain/improve health room environment
- Conduct vision screenings (3rd, 4th, 5th, ECE students)
- Conduct hearing screenings (kindergarten thru 3rd grade, ECE, and referred 4th and 5th graders)

After one year of implementation and review of pilot data, there was strong interest in providing nurses to a larger number of schools. It was determined that this could best be accomplished by providing licensed practical nurses (LPNs) to schools who would be supervised by regional ARNPs. The scope of practice for LPNs is narrower than for ARNPs but considered adequate for the majority of duties that are carried out by a school nurse. In cases where their duties go beyond their scope of practice (e.g., conduct hearing screenings), the ARNP for that academic area provides assistance and oversight.

Today, there are 26 school nurses (25 elementary and 1 high school) assigned to one JCPS school, resulting in a student to nurse ratio of approximately 500:1, well within the NASN recommendations. However, only 6 ARNPs are available **for the remaining general JCPS population (14,500:1 student to nurse ratio), far from the NASN recommendation described earlier. Nurse staffing has not changed since the 2010-2011 school year.**

Table 1 shows that with one exception (Duval County), the remaining seven benchmark districts for JCPS all show a substantially smaller student to nurse ratio. For instance, the student to nurse ratios for Baltimore City are 457:1 and 839:1 for Northside, TX. The information shown in Table 1 was gleaned from a wide range of sources ranging from a district's web page to on-line newspaper articles and only contains data for the benchmark districts with online information available. It appears that the majority of JCPS benchmark districts provide substantially more school nurses for their students. In fact, only Duval County has a higher student to nurse ratio than JCPS.

Table 1

Status of School Nurses for JCPS Benchmark Districts

School District	#School Nurses	Student to Nurse Ratio
1. Louisville, KY	26	500:1 - 26 Schools with Nurses; 14,500:1 – Remaining A-1 Schools
2. Austin TX	75	1134:1
3. Charlotte, NC	161	1100:1
4. Cobb Co, GA	124	899:1
5. Pinellas, FL	56	1853:1
6. Duval, FL	33	3880:1
7. Long Beach, CA	36	2200:1
8. Northside, TX	121	839:1
9. Baltimore City, MD	186	457:1

The school nurse initiative aligns with the JCPS Strategic Plan, Vision 2020 in the following ways:

Focus Area: *Learning, Growth, and Development*

Strategy 1.1.3: *Provide equitable access*

Develop and improve systems and practices to recognize student strengths and to provide equitable access to engaging learning opportunities, supports, and resources.

Focus Area: *Improving Infrastructure and Integrating Systems*

Strategy 3.1.2: *Improve instructional infrastructure*

Create a comprehensive needs assessment and five-year strategic infrastructure plan that identifies the current state of the district's infrastructure, projects the long-term needs aligned with strategic priorities, and prioritized investment and implementation taking into account safety, equity impact on student learning, impact on system performance, and available funding.

OVERALL HEALTH

There are over 8900 students with at least one of health condition in JCPS schools. This is most likely an underestimate of the actual number of conditions since many students have more than one health condition and documentation of anything requires an official form completed by a physician. Asthma and food allergies are the most commonly health conditions documented by schools overall (see Table 2). At least 1717 students at A-1 schools with nurses have at least one health condition. This represents **19%** of students with health conditions for all schools and **40%** of students with health conditions for all A-1 elementary schools (i.e., 4332 students with at least one health condition). 1544 cases of asthma for schools with nurses represent **37%** of all cases for elementary schools. Additionally, cases of asthma have increased substantially across the district and at the elementary level. For instance, there were 2,050 asthma cases at the A-1 elementary level in 2014, compared to 4,218 cases in 2015, resulting in an increase of over 100% over the course of one year.

HEALTH COMPLIANCE DATA

Immunizations are required to be compliant with requirements within two weeks of enrollment; otherwise, it is JCPS policy at this point to not allow students to attend school until the immunizations are compliant unless there is a formal medical or religious exemption. If a student is still noncompliant one month after enrollment, the case is treated as truancy and the pupil personnel department is notified. Obviously, there are financial costs associated with students missing school that may go beyond the Health Services Department. Most seriously, are potential costs for outbreaks that occur when students and staff are exposed to a preventable disease. For instance, there was an outbreak of mumps in a JCPS elementary school three years ago that resulted in up to a six week absence from school for both students and staff. Immunization compliance data showed that the best compliance rate for A-1 schools was for those with school nurses at **94.2% compared to 91.5%** for A-1 schools without

Table 2**Most Frequently Documented Health Conditions 2015**

HEALTH CONDITION	A-1 EL DISTRICT
Asthma, unspecified	4218
Food allergy	1145
ADHD/Attention deficit disorder with hyperactivity	751
Anaphylaxis, allergic shock	560
Allergy, unspecified	520
Unspecified convulsions	260
Lactose intolerance	177
ADD/Attention deficit disorder	151
Other convulsions/seizures	120
Infantile autism/childhood autism/autistic disorder	66
HEALTH CONDITION	A-1 EL SCHOOLS WITH NURSES
Asthma, unspecified	1544
ADHD/Attention deficit disorder with hyperactivity	408
Food allergy	361
Allergy, unspecified	187
Anaphylaxis, allergic shock	97
Unspecified convulsions	97
Lactose intolerance	73
Other convulsions/seizures	57
Infantile autism/childhood autism/autistic disorder	38
Gastrostomy	19

nurses. Of the 25 A-1 elementary schools with nurses, **48% had compliance rates of 100%**. The remaining 65 A-1 schools had 29.2% of their schools with compliance rates of 100%. **The 2015 immunization compliance data showed that elementary schools with nurses had a 98% compliance rate compared 94.6% for the control schools, resulting in a statistically significant difference $t(47) = 2.44, p = .019$ with schools with nurses having higher compliance rates.** Though compliance rates for vision exams, dental exams, and physicals were higher for schools with nurses than the control group, the difference was not statistically different. Compliance rates for physical, vision, and dental exams for schools with nurses are also shown in Table 3. The immunization decision rules used by ARNPs and LPNs to enforce the JCPS immunization policies are shown in Appendices A-1 and A-2.

Table 3**2015 HEALTH PERCENT COMPLIANCE DATA ELEMENTARY SCHOOLS WITH NURSES**

SCHOOLS WITH NURSES	IMMUNIZATIONS	PHYSICALS	VISION EXAMS	DENTAL EXAMS
Atkinson Academy	95.7	95.71	80.26	87.28
Auburndale Elementary	99.03	86.40	88.13	90.25
Cochran Elementary	98.04	88.23	86.44	93.58
Coleridge-Taylor Elementary	100	100	98.02	98.27
Coral Ridge Elementary	100	98.66	94.53	95.53
Engelhard Elementary	94.8	90.62	46.89	87.02
Fairdale Elementary School	97.92	95.83	90.90	90.69
Frayser Elementary	96	97.33	91.83	89.47
Goldsmith Elementary	100	98.00	96.06	96.03
Gutermuth Elementary	98.63	98.63	92.59	96.90
Hawthorne Elementary	100	100	95.75	95.45
Hazelwood Elementary	91.18	83.82	70.56	70.25
Indian Trail Elementary	100	100	98.97	97.89
Jacob Elementary	98	98	97.36	95.80
Klondike Elementary	100	100	100	99.28
Minors Lane Elementary	98.75	95	64.91	76.05
Portland Elementary	97.96	97.95	78.57	98.57
Price Elementary	100	97.53	95.45	95.37
Rangeland Elementary	98.61	97.22	73.52	96.00
Roosevelt Perry Elementary	98.61	90.27	69.67	81.13
Semple Elementary	93.07	91.08	68.65	90.96
Wellington Elementary	100	98.73	96.89	97.54
Wheatley Elementary	95	76.66	61.06	75.24
Wilkerson Elementary	100	100	82.24	86.73
Young Elementary	98.61	98.61	85.53	93.44
SCHOOL NURSE AVERAGES	98%*	95%	84.2%	91%
CONTROL GROUP AVERAGES	94.6%	93.6%	78.4%	89.2%

* $t(47) = 2.44, p = .019$.

OFFICE VISITS

JCPS School Nurses at 25 elementary schools and 1 high school responded to over 55,000 office visits from students during the 2014 school year (see Table 4). Approximately 88.1% of student office visits resulted in the student being returned to class last year, compared to 81.4% during the 2014 school year. It should be noted that 2,290 visits weren't classified in terms of discharge type. If these discharges were students returned to class (and it's likely that the majority were), the return rate would be 91.9%.

Table 4

Enrollment, Office Visits, and Student Conditions with at Least One Health Condition for Each School Nurse Location*

SCHOOL	ENROLLMENT	OFFICE VISITS	#STUDENTS WITH HEALTH CONDITIONS
Atkinson Academy	388	1078	69
Auburndale Elementary	590	1585	82
Cochran Elementary	293	1772	35
Coleridge-Taylor Elementary	577	4635	154
Coral Ridge Elementary	479	2038	43
Engelhard Elementary	415	1994	58
Fairdale Elementary	599	3339	63
Fern Creek High School	1546	1985	81
Frayser Elementary	377	833	46
Goldsmith Elementary	614	2069	53
Gutermuth Elementary	414	1473	80
Hawthorne Elementary	426	3310	55
Hazelwood Elementary	336	1974	61
Indian Trail Elementary	424	1542	61
Jacob Elementary	635	2128	98
Klondike Elementary	551	2374	41
Minors Lane Elementary	396	1140	34
Portland Elementary	300	2947	39
Price Elementary	513	3207	84
Rangeland Elementary	494	2507	59
Roosevelt Perry Elementary	422	2743	72
Semple Elementary	516	1252	60
Wellington Elementary	429	3390	89
Wheatley Elementary	354	770	42
Wilkerson Elementary	468	1736	58
Young Elementary	500	1720	64
GRAND TOTAL	13056	55,541	1681

*Separate entries for the same visit (e.g. multiple diagnoses) were counted as one visit.

SCHOOL ATTENDANCE

A control group of 24 Title 1 elementary schools was constructed to test the impact of school nurses on elementary school attendance. Since all school nurses were in place by 2012, the analysis was conducted for the years 2011 through 2014 (i.e., 2011 is the baseline year). Although the control group consisted of only Title 1 schools they tended to have a lower free/reduced lunch (F/RL) rate than the schools with nurses (81.05% vs. 84.99%, respectively) so F/RL was treated as a covariate in the analysis. Actual minutes absent were calculated to account for partial absences. Comparisons were made at the school level since the school nurse is available to all students within the school. Results of the repeated measures (school years) analysis of variance on 2014 showed a significant difference in favor of school nurses $F = (1, 46) = 5.15, p = .028$. On average, students at schools with nurses over a four year period from 2011 through 2014 had average absences of 4.8 minutes per day compared to 5.1 minutes per day for schools without nurses. While the effect size is small (i.e., $d=.1$), this equates to a **savings of 54.25 minutes per student** over the course of the school year. The updated analysis still show a very small advantage for schools with nurses over the five year period $F = (1, 46) = 4.1, p = .048$; however, when you look at the one year difference (i.e. 2015), it is clear that the advantage did not hold for the past year. Both groups increased absences in minutes.

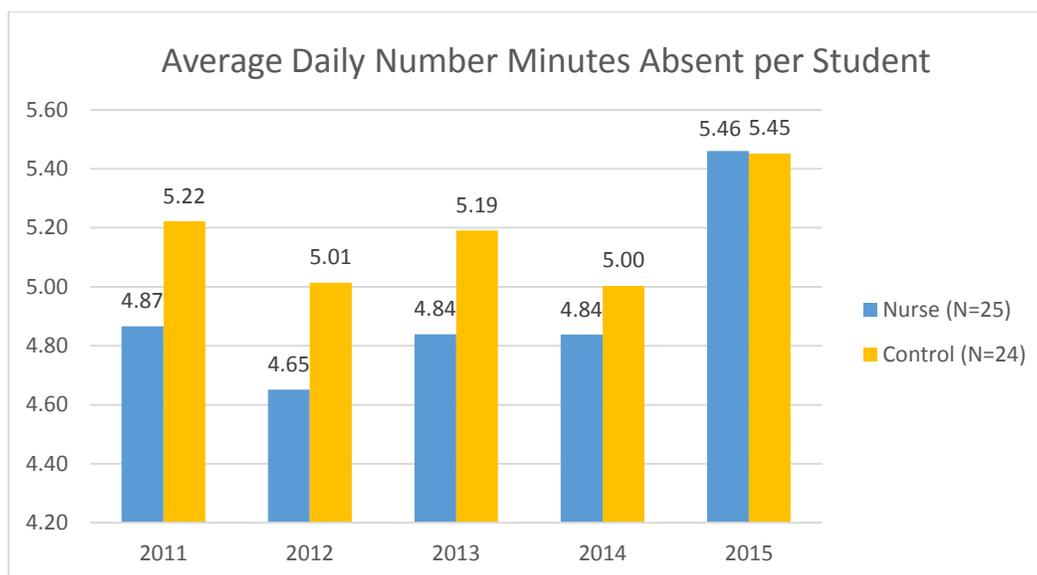


Figure 1. Average daily number minutes absent per student.

Kentucky Performance Rating for Educational Progress (KPREP)

The accountability data for the Kentucky Performance Rating for Educational Progress (KPREP) did not show any statistically significant difference between the schools with the nurses and the control group for overall scores, non-duplicated gap scores, growth scores, or reading proficiency scores for the 2011 vs. 2014 analyses. In this case, F/RL accounted for a significant amount of the variance on every single

measure. The 2015 update also did not show any advantage for schools with nurses for growth in reading or math.

Comprehensive School Survey Data

A multivariate analysis of variance (MANOVA) with F/RL rate as a covariate for JCPS Comprehensive School Survey items related to personal feelings of safety and relationships failed to show a statistically significant difference between the schools with nurses and the control group.

COST

Forty-two all day contract nurses are currently serving 36 JCPS school sites. These nurses are required and the nurse contractor can fill with either an RN or LPN even though LPN services cost substantially less. The hourly rate for a contract RN is \$34.56 per hour which is equivalent to \$52,807 if they work 8 hours per day, 191 days per year, the same as JCPS LPNs. The yearly salary of a JCPS LPN is estimated with salary and fringes to be \$39,177. Replacing the current 19 contract RNs with JCPS LPNS would result in a savings of **\$258,970. Another major difference between contract nurses and JCPS nurses is that contract nurses are usually assigned to only one student in the entire school. A JCPS nurse could fulfill the required student's needs while also having time to provide consistent services to other students within the school.**

CONCLUSIONS AND RECOMMENDATIONS

Analysis of the school nurse data in prior years has shown stronger outcomes for attendance, return-to-class rates, and academic scores in reading while the past two years have shown a small advantage for attendance as the primary outcome. It is unknown what underlies the difference between the past two year's analyses and previous years. Possibilities include changes in policy adherence related to immunization compliance and attendance (i.e., students out of compliance aren't allowed to attend school until immunizations are up-to-date), less stringent record keeping of students returned to class, and/or lack of a strategic connection within the school to the health services/resources provided by the nurses. Basch (2010) maintains that health inequities are prevalent for children in urban areas – and although public schools can't be expected to meet all of a community's needs, the reality is that no other social entity has the same consistent opportunity to address health disparities of our urban youth.

Clearly, over 55,000 health office visits indicates a need for health services within our schools. The immunization compliance rate for schools with nurses was 98% vs. 94.6% for schools without nurses. Though a significant difference, it also may point to higher rates of absences due to more stringent enforcement of attendance policies in schools with nurses. Over 8900 JCPS students all schools have at least one documented health condition. That's an average of 58 students per school whose health needs during some point are attended to by trained school staff, often school clerks who are required to administer medication and provide or medical support in addition to their regular duties.

Recommendations for consideration include:

- Seek ways to provide services to more JCPS students by replacing at least some of the contract nurses with JCPS LPNs.
- Cultivate community partnerships with agencies already invested in youth community health.
- Ensure that JCPS nurses understand and follow office visit documentation requirements.
- Use collaborative strategies with the school FRYSC and counselor (at a minimum) to address student needs and build relationships which improve parental compliance with health regulations and attendance.
- Expand school nurse services to mirror those provided in benchmark districts using best practices for student health services.

REFERENCES

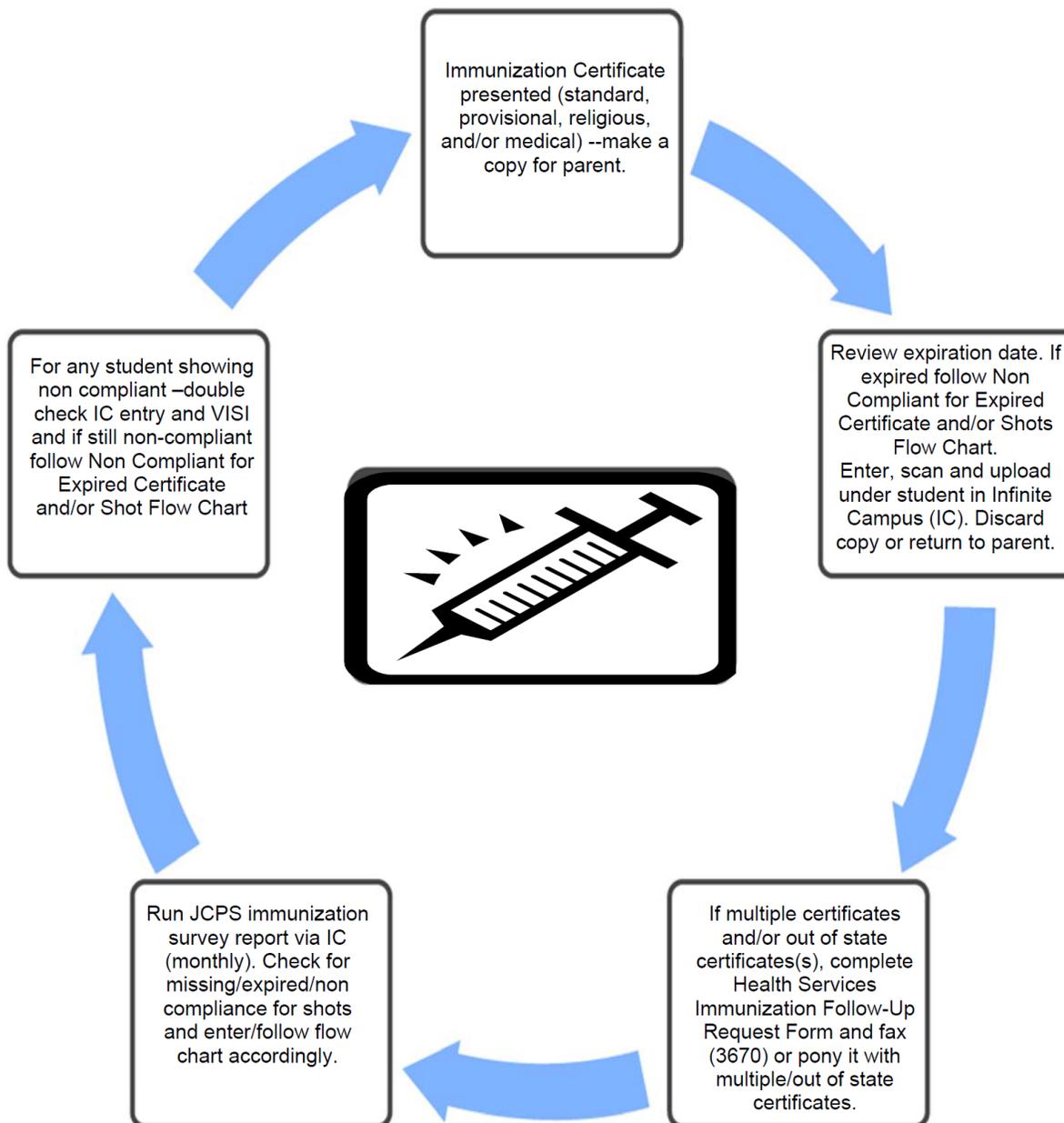
Basch, C. E. (2010). Healthier Students are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap. Retrieved March 15, 2010 from http://www.equitycampaign.org/i/.../12557_EquityMattersVol6_Web03082010.pdf .

National Association of School Nurses (2006). Position Statement on Caseload Assignments. Retrieved April 20, 2010, from <http://www.nasn.org/Default.aspx?tabid=209> .

APPENDIX A-1

IMMUNIZATION COMPLIANCE FLOW CHART
Updated 2/20/15

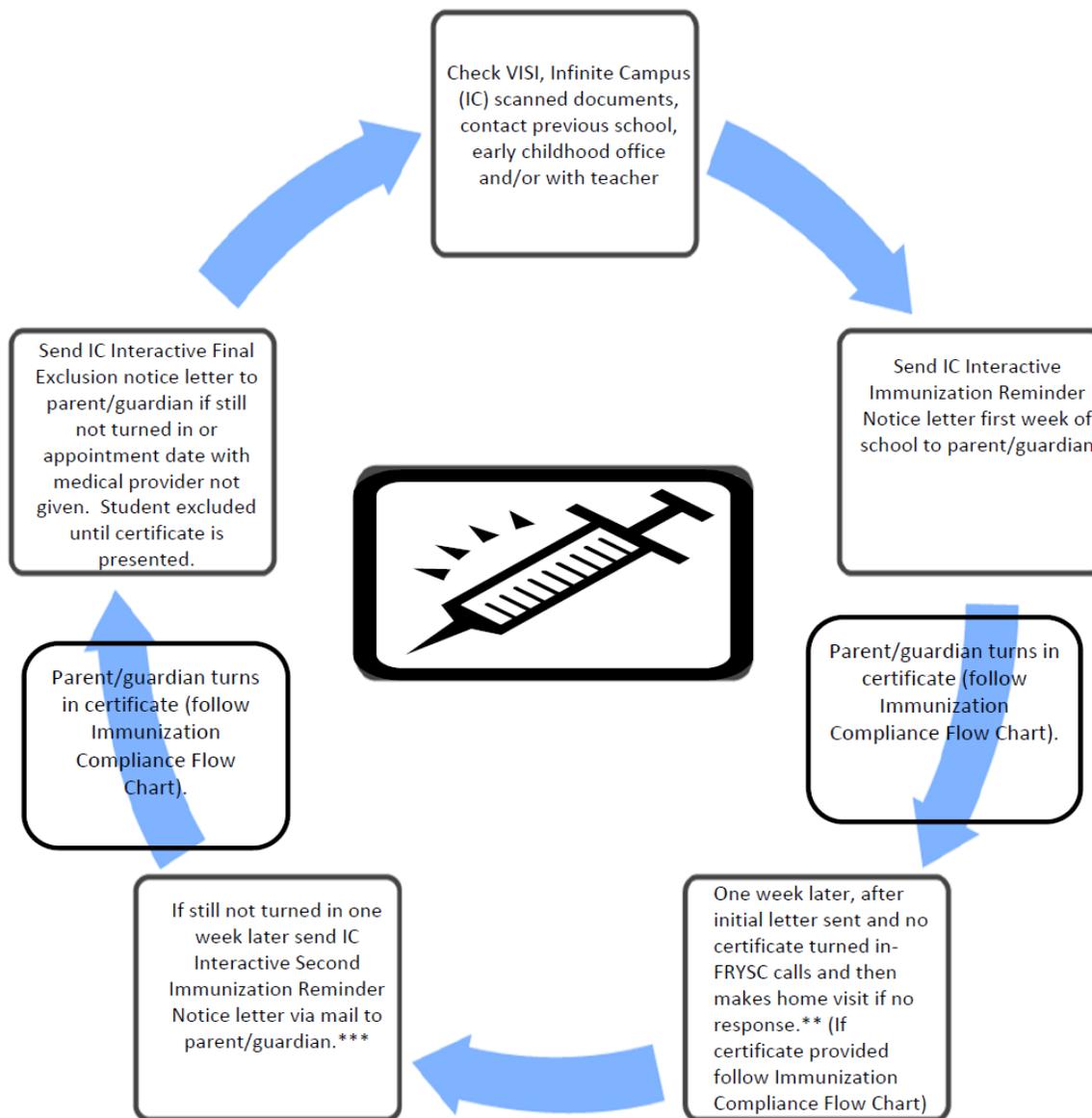
Every student must have a current and valid immunization certificate on file at the school they are attending with a complete and appropriate shot history (complete list of dates (month/day/year) for all vaccines administered since birth). This is due on file within two weeks of enrollment and the certificate shall be maintained current. (KRS 158.035 Certificate of Immunization, JCPS Board Policy 9.21 & 9.211)



APPENDIX A-2

NON-COMPLIANT FOR EXPIRED CERTIFICATE AND/OR SHOTS FLOW CHART
Updated 2/20/15

Every student must have a current and valid immunization certificate on file at the school they are attending, with a complete and appropriate shot history (complete list of dates (month/day/year) for all vaccines administered since birth). This is due on file within two weeks of enrollment and the certificate shall be maintained current. (KRS 158.035 Certificate of Immunization, JCPs Board Policy 9.21 & 9.211)



**** If no FRYSC; Counselor takes care of this step. School clerk should also notify Social Work/ADPP and IF they are making a home visit they should inquire also.**

***** Contact Health Services Nurse Practitioner (3387) to check on scheduled immunization clinics. Send permission form to parent/guardian. Student brought (parent, bus, etc.) to Area clinic or parent provides medical provider appointment date—if not, follow next step in flow chart to exclude.**