State University Partnership Research Brief
Medication Prescribing to Children Insured by Kentucky Medicaid

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What is Known on This Topic?
Antibiotics are lifesaving medications used to treat bacterial infections. Use of these medications in pediatric populations can result in harmful side effects and/or the development of antibiotic resistance. On average 2.8 million antibiotic resistant infections occur annually, and 30% of all outpatient antibiotic prescribing is unnecessary. Yet, Kentucky outpatient antibiotic prescribing is highest in the nation for children, with KY Medicaid spending nearly $17 million on antibiotic prescriptions for children in 2017 alone.

What Did this Project Do?
This study had two aims: (1) to describe antibiotic prescribing by Managed Care Organizations (MCOs) and (2) examine appropriateness of antibiotic prescribing using trend analyses by linking pharmacy and pediatric medical claims data.

What Could Medicaid Do with These Conclusions?
Medicaid is a major stakeholder in health care for children. Insights on reducing costs, improving antibiotic stewardship, providing educational resources, and administrative oversight are discussed.

Introduction

The use of antibiotics is concerningly high in the US. There are enough antibiotics prescribed each year for 5 out of every 6 Americans to receive 1 round of antibiotic therapy.[1] Even more concerning – rates of outpatient antibiotic prescriptions are highest among children.[2] In this regard, Kentucky has rates of antibiotic use in children that are ~50% higher than national estimates.[3] Antibiotics are lifesaving medications that can treat, and even cure, otherwise fatal infections; however, inappropriate use of these medications can have an adverse effect. Antibiotic resistance is a serious concern for public health authorities. According to a recent report from the Centers for Disease Control & Prevention, at least 2.8 million antibiotic resistant infections occur annually, with an estimated 35,000 deaths due to these infections.[4] Examining the appropriateness of antibiotic prescribing to Kentucky children is imperative to reduce deleterious effects of antibiotics and avoid preventable costs.

Kentucky Medicaid. For the past 7 years, Kentucky has had among the highest antibiotic prescribing rates per 1,000 persons in the country. In 2017 alone, Kentucky Medicaid spent $16.8 million on antibiotic prescriptions for children across the state. However, studies show that approximately 30% of all outpatient antibiotic prescribing is unnecessary.[5] Therefore, Kentucky Medicaid, a major healthcare stakeholder, could perhaps save several million dollars annually by reducing nonessential and inappropriate antibiotic prescribing to these children.

Project Methods and Results

This study had two aims: (1) to describe antibiotic prescribing to children by Managed Care Organizations (MCOs), and; (2) examine appropriateness of antibiotic prescribing using trend analyses. Antibiotic prescriptions were identified from pharmacy claims data and linked to pediatric medical claims. Guidelines related to a prescribing appropriateness classification scheme were used to categorize antibiotic prescriptions as "appropriate", "potentially appropriate", "inappropriate", or "not associated with indication".

Table 1: Antibiotic Use Distribution by MCO (2017)

	Aetna	Anthem	Humana	Passport	WellCare
Count of Prescriptions	189,714	40,926	52,514	151,226	327,898
	Total = 762,278				
Count of Children	137,582	43,170	50,144	149,559	218,091
	Total = 598,546				
Prescriptions per 1,000 children	1,379	948	1,047	1,011	1,503

Aim 1: Antibiotic Prescribing by MCO

Findings based on antibiotic use distribution by MCO concluded that overall prescriptions per 1,000 children were highest among WellCare (n=1503) and Aetna (n=1379), followed by Humana (n=1047), Passport (n=1011), and Anthem (n=948). Additionally, when considering the number of children and count of prescriptions, Anthem had the highest rate of prescribing, with WellCare having the lowest rate (see Table 1). Across all MCOs, antibiotic prescribing rates per 1,000 children were highest among females, children aged 0-2, and White, Non-Hispanic children. Further, across Medicaid regions in the state, antibiotic prescribing in Medicaid-enrolled children revealed major discrepancies between metro and Non-metro areas (see Figure 1).

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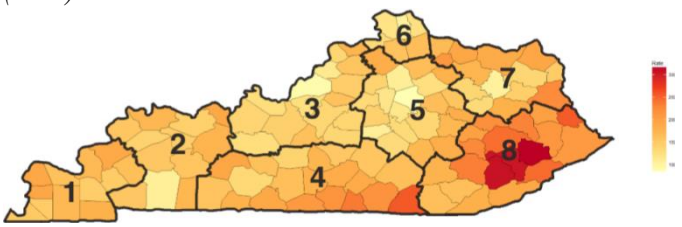
Figure 1*: Rate of antibiotic prescriptions per 1,000 children by county (2016)**



***Kentucky Medicaid Regions are outlined and numbered**

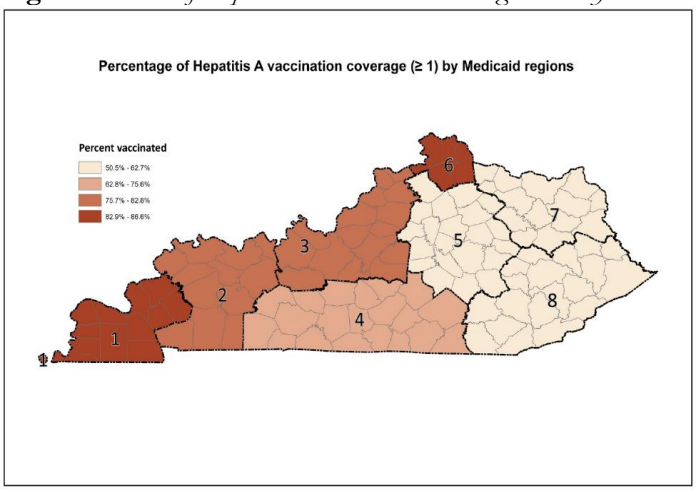
Aim 2: Appropriateness of Antibiotic Prescribing

Of the 762,278 antibiotic prescriptions to child beneficiaries, a trend analysis revealed one-fifth were appropriate (19.5%), almost half were deemed potentially appropriate (45.3%), one-fifth were considered inappropriate (20.8%), and the remainder were not associated with an indication (14.4%). Inappropriate antibiotic prescribing was more likely to be authorized by general practitioners (22.2%), more common among children aged 0-2 (24.4%), and those living in non-metro regions (22.2%). Among all antibiotic medications, Amoxicillin was most prescribed across all appropriateness categories, with Azithromycin being the second and frequently prescribed for inappropriate and non-diagnostic code indications. For both appropriate and potentially appropriate indications, Cefdinir was commonly prescribed.

Hepatitis A Vaccinations in Kentucky Children

In addition to the aforementioned study aims, the study authors reported on data concerning the uptick of Hepatitis A vaccines by Kentucky children. In response to a particularly large outbreak of Hepatitis A in 2017, changes were made in the summer of 2018 to mandate the Hepatitis A vaccine for all Kentucky students. Figure 2 displays these results by Medicaid region from 2012-2017 claims data (darker shades = higher rate of vaccination).

Figure 2: *Rates of Hepatitis A vaccination among Kentucky children*



Conclusions & Health Policy Implications for Medicaid

In sum, antibiotic prescribing rates across all MCOs were considerably higher for females, younger children (0-2 years), those residing in non-metro areas, and White, Non-Hispanic children. Similarly, *inappropriate* antibiotic prescribing for child beneficiaries were more common among non-metro children, the youngest population (0-2 years), and frequently authorized by general practitioners compared to specialists.

Potential practice and policy changes derived from these results are described in Table 2. Particularly, efforts to measure and monitor antibiotic prescribing is one of the most promising initiatives. For example, the Kentucky Antibiotic Awareness (KAA) campaign disseminates educational materials via presentations to providers, research, and on social media platforms. These efforts can be implemented in a variety of pediatric settings (e.g., clinics, hospitals, immediate care centers). Further, it is also possible that these measures could aid in reducing annual Medicaid costs for children statewide.

Table 2: *Antibiotic Policy Implications for Kentucky Medicaid*

Policy Options	Description
Data availability/ monitoring	Give providers and MCOs data on their anitbotoic prescribing practices. Regularly monitor use.
Antibiotic stewardship	Offer and disseminate resources, increase data insights on prescribing, implement behavioral prompts into daily practices through electronic medical records.
Educational Opportunities	Educational materials and training efforts can provide transparency to providers and the community.
Public policy & administrative oversights for KY Medicaid Program	Establish payment models (e.g., value-based) that reimburse providers for quality care outcomes. Require and regulate stewardship programs in healthcare settings and among MCOs. Implement prior authorization protocols.

References

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