**Executive Summary**

Excellus BlueCross BlueShield has committed to helping its employees and community members understand the importance of taking medications as directed. Medication adherence, the extent to which patients take medications as prescribed, has been identified as a key to combating several chronic and acute illnesses. Published medical literature suggests that less than half of patients continuously take medications as directed and that suboptimal medication adherence is associated with economic losses, disease progression, lower quality of life and premature death.\(^1\) Additionally, non-adherence to antibiotics is a public health concern and can lead to the emergence of antibiotic resistant bacteria.\(^2\)

With advances in pharmacotherapies, chronic diseases and short-term illnesses have become highly treatable and manageable. Yet due to non-adherence, benefits are not realized for all patients with treatable illnesses. To understand this phenomenon in upstate New York, Excellus BlueCross BlueShield developed a comprehensive online survey that sought to obtain a first-hand perspective on the barriers that exist between patients and treatments.

Key issues explored in this survey include:
- Medication adherence among those with chronic conditions.
- Medication adherence among those who had taken an antibiotic within the last six months.
- Self-reported consequences of non-adherence.
- Self-reported barriers to medication adherence.
- Strategies used by respondents to aid in adherence.
- Attitudes towards discussing missed medications with doctors.
- Attitudes towards the importance of taking medication as directed.

**Methods**

Excellus BCBS commissioned One Research to conduct an online survey of upstate New York adults. Participants were recruited from a vendor panel by email invitation to take the survey between Nov. 21, 2014, and Dec. 8, 2014. Participants were not asked to disclose their health insurance provider. Survey respondents had to be at least 18 years old and living within the health plan’s 39-county coverage area. Respondents were assigned a group based on whether he or she reported currently taking medication for a chronic condition or previously taking an antibiotic within the last six months. Respondents who were on medication for a chronic condition and had taken an antibiotic in the last six months were randomly assigned to either group. A distinct path of survey questions were assigned for the chronic condition group (n=1244) and a separate path for the antibiotic group (n=257). In conducting this analysis, data were tested at a 95 percent confidence level.
Survey Results - Key Findings:

Medication Adherence

- Both antibiotic users and those on a medication for a chronic condition agree that it’s important to take medications as directed. There is also a high level of comfort knowing how to take medications as prescribed.
- Those with chronic conditions are more familiar with regularly taking medications.
- Consistent with national studies, “forgetting/not having pill with me” was the primary reason for medication non-adherence for those on an antibiotic or on a medication for a chronic condition.

Chronic Conditions

Chronic conditions reported by respondents of the survey included high blood pressure, heart trouble, diabetes, asthma, depression, high cholesterol and cancer. Other self-reported conditions included thyroid conditions, migraine, arthritis and colitis/Crohn’s disease.

- Of those with a chronic condition that were non-adherent, 17 percent reported that symptoms of their condition returned.
- Of those taking medication for a chronic condition within the past three months, 58 percent always took their medication as directed, 24 percent missed one dose of medication, 13 percent missed more than one dose, and 11 percent took medication late.

On the next page are key areas where significant differences in responses were found when comparing those with the five most common chronic conditions; diabetes, depression, asthma, high blood pressure and high cholesterol.
Chronic Conditions continued

- Those with high blood pressure, high cholesterol or diabetes were least likely to report that they experienced symptoms when they were non-adherent. For those with high blood pressure and high cholesterol, this is most likely due to the silent nature of the condition.

- Those with diabetes are more likely to return to their meds within one day of non-adherence than those with high blood pressure, high cholesterol, asthma or depression.

- Those with depression are most likely to report that the effectiveness of the medication was a reason for non-adherence.

- Those with diabetes are most likely to rely on their partner/spouse for help with taking medications as directed than those with high blood pressure or high cholesterol.

- Those with high cholesterol are more likely than those with asthma, depression and diabetes to trust their doctor to make decisions that are in their best interest.

- Those with high blood pressure or high cholesterol are less likely to use online resources to gather information about their condition or treatment than those with depression.

The results of the survey showed that those who reported having asthma stood out among other chronic conditions. The survey found that those with asthma are more likely to cite side-effects as a reason for non-adherence compared to those with high blood pressure or high cholesterol. However, when those with asthma did not adhere to their medications, they were more likely to experience asthma-related symptoms than those with high blood pressure, high cholesterol or diabetes. Additionally, those with asthma are:

- More likely to have been prescribed an antibiotic in the past six months than all other conditions.

- More likely to cite cost as a reason for non-adherence compared to those with high blood pressure, high cholesterol or depression but are less likely to use generics to reduce the cost of their meds than those with high blood pressure, high cholesterol or depression.

Antibiotics

- About one-fifth of those prescribed an antibiotic missed a dose or stopped taking their medication. Of this group, 57 percent missed two or more doses.

- Of those who were non-adherent to antibiotic prescriptions, 15 percent reported that their symptoms returned.

Taking antibiotics as prescribed is crucial to ensure that antibiotic resistant bacteria do not develop. When only a portion of prescribed antibiotics are taken, bacteria that are most sensitive to the antibiotic will die off, leaving some of the stronger bacteria to multiply and spread. These surviving bacteria have some natural resistance but would most likely not have survived the full course of antibiotic treatment. Since they were able to survive, they can pass on their resistant genes and form a new strain of germs that are difficult to control.

The Centers for Disease Control recommends that patients take antibiotics exactly as prescribed, to not skip any doses and complete the entire course of treatment, even if symptoms have subsided. ³
Regional Differences in Medication Adherence

Rochester region:
- Those in the Rochester region are more likely to have missed more than one dose of their medication within the past three months than those in Central New York and Western New York regions.
- Those in the Rochester region are more likely to currently be using generic medications as a method to reduce prescription cost than those in Utica and Western New York regions.

Utica region:
- Those in the Utica region are more likely to cite cost as a reason for non-adherence compared to those in Rochester, Central New York and Western New York regions.
- Those in the Utica region are more fearful of their doctor’s reaction (to telling them they missed their medication) than those in the Rochester, Central New York and Western New York regions.
- Those in the Utica region are more likely to have been prescribed an antibiotic in the past six months than those in the Rochester region.

Central New York and Southern Tier:
- Those in the Central New York region are less likely to have missed more than one dose of their medication within the past three months than those in the Rochester region.
- Those in the Central New York region are less fearful of their doctor’s reaction (to telling them they missed their medication) than those in the Utica region.

Western New York:
- Those in the Western New York region are less likely to have missed more than one dose of their medication within the past three months than those in the Rochester region.
- Those in the Western New York region are more likely to have their doctor’s office follow up to make sure they are taking their medication as directed than those in the Rochester region.
Demographic Information

The demographics of the respondents indicate that the survey sample was representative of upstate New Yorkers and therefore weighting was unnecessary. Respondents assigned to the chronic condition path were significantly older (mean age=57) and were more likely to have Medicare (32 percent) than those in the antibiotic arm (mean age=50, 23 percent Medicare). Respondents in both groups were about two thirds female and one third male. In the antibiotic group, respondents were more likely to be employed full time than in the chronic condition group. More than 60 percent of total respondents had income of $50,000 or more. Over half of respondents had graduated college or had done post graduate work.


Methodology

Survey development: Excellus BlueCross BlueShield commissioned One Research to conduct an online survey of adults living within 39 counties of upstate New York.

Survey field dates: November 21 through December 8, 2014

Number of interviews:

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Chronic condition</th>
<th>Antibiotic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1501</td>
<td>1244</td>
<td>257</td>
</tr>
</tbody>
</table>

Recruitment: Respondents were recruited from a vendor panel via email invitations to take the survey.

Screening criteria: Respondents must be at least 18 years old and live in counties served by Excellus BCBS and its parent health plan. Respondents in the chronic condition arm had to currently be taking a medication to treat a chronic condition. Respondents in the antibiotic arm had to have taken an antibiotic within the past 6 months.

Weighting: Data from this study were not weighted.

Confidence testing: In conducting this analysis, data were tested at 95% confidence. Testing differences in data between subgroups at the 95% confidence level indicates that there is no more than a 5 in 100 chance that the differences observed could have been obtained by chance.
Key findings

• Both antibiotic users and those on a medication for a chronic condition agree that it’s important to take medications as directed (Slide 4) ... and there is a high level of comfort knowing how to take medications as prescribed. (Slide 5)

• Of those taking medication for a chronic condition within the past three months, 58 percent took their medication as directed, 24 percent missed one dose of medication, 13 percent missed more than one dose, and 11 percent took the medication late. (Slide 6)

• Of those with a chronic condition that were non-adherent, 17 percent reported that symptoms of the conditions returned. (Slide 7)

• Of those prescribed an antibiotic, 21 percent missed a dose or stopped taking the medication; and of that group, 36 percent missed two doses and 22 percent missed three or more doses. (Slide 8)

• Of those who were non-adherent in taking their antibiotics, 15 percent reported that their symptoms returned. (Slide 8)

• Consistent with national studies, forgetting/not having pill with me was the primary reason for medication non-adherence for those on an antibiotic or a medication for a chronic condition. (Slide 9)

• Of those with a chronic condition, 23 percent rely on a spouse or partner to make sure that they take their medication as prescribed; and of those taking an antibiotic, 16 percent rely on a spouse or partner. (Slide 12)
Both antibiotic users and those on a medication for a chronic condition agree that it’s important to take medications as directed. There is also a high level of comfort knowing how to take medications as prescribed.

**Importance of medication adherence**

<table>
<thead>
<tr>
<th>Importance</th>
<th>Chronic Condition</th>
<th>Antibiotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all important</td>
<td>7%</td>
<td>28%</td>
</tr>
<tr>
<td>Extremely important</td>
<td>63%</td>
<td>66%</td>
</tr>
</tbody>
</table>

**Comfort taking medications as prescribed**

<table>
<thead>
<tr>
<th>Comfort</th>
<th>Chronic Condition</th>
<th>Antibiotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all comfortable</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Extremely comfortable</td>
<td>86%</td>
<td>78%</td>
</tr>
</tbody>
</table>

Q18./Q33. How important is it for you to always take your medication as prescribed? (n=1,244 / n=257)

Q19./Q34. How comfortable do you feel knowing how to take your medication(s) as prescribed? (n=1,244 / n=257)
Chronic condition respondents are much more familiar with regularly taking medications than are respondents taking an antibiotic.

### Chronic conditions

- **High Blood Pressure**: 44%
- **Heart trouble/failure**: 19%
- **Diabetes**: 7%
- **Asthma**: 3%
- **Depression**: 2%
- **High Cholesterol**: 10%
- **Other**: 12%
- **Not on med for chronic condition**: 17%
- **Cancer**: 1%
- **Other**: 9%
- **Not on med for chronic condition**: 1%

**Including:**
- Thyroid conditions
- Migraines
- Arthritis
- Colitis/Crohn’s

Q4. Are you currently taking a medication to treat a chronic condition?
Q5. For which of the following conditions, if any, are you currently taking a prescription medication(s)? Please select all that apply.

= Statistically Significant Difference
Over half (58%) of those with a chronic condition took their medication as directed within the past three months.

Q11. Please indicate if any of the following applies to how you took your medication during the past 3 months. (n=1,244)

- I always took my medication as... (58%)
- I missed one dose of medication (24%)
- I missed more than one dose of... (13%)
- I took medication late (11%)
- I took less than the prescribed dose (5%)
- I took medication early (3%)
- I took too much medication (1%)

Past three months - Adherence
Those with a chronic condition who are non-adherent generally report that nothing occurred when they missed a dose or stopped taking their medications.

**Result of missing/Stopping medications**

- Nothing occurred: 79%
- I had symptoms related to my condition: 17%
- I had to visit the doctor: 1%
- I missed out on a social event: 1%
- I missed school/work: 1%
- I was hospitalized: 1%
- I had to visit the ED: 0%

Q9. Did any of the following occur when you missed a dose of or stopped taking your medication? (n=412)
About one-fifth of those prescribed an antibiotic missed a dose or stopped taking their medication.

Of those who missed a dose/stopped taking their antibiotic, 15% reported that their symptoms returned.

Q25. While taking the antibiotic, did you ever miss a dose or stop taking your antibiotic medication? (n=257)
Q25a. How many doses of the antibiotic medication did you miss? (n=53)
Q26. When you stopped taking/missed a dose of your medication, did your symptoms come back? (n=53)
Consistent with national studies\textsuperscript{1-6}, forgetting/not having pill with me was the primary reason for medication non-adherence for those on an antibiotic and on a medication for a chronic condition.

Q12./Q27. What are the primary reasons you have ever stopped taking or changed the way you take your prescription medication(s)? (n=1,244 / n=257)

- **Not having symptoms/Symptoms went away** for Chronic Arm; **‘My symptoms went away/I was not having symptoms’** for Antibiotic Arm

<table>
<thead>
<tr>
<th>Reason for non-adherence</th>
<th>Chronic condition</th>
<th>Antibiotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgot/Did not have pills with me</td>
<td>48%</td>
<td>32%</td>
</tr>
<tr>
<td>Side effects</td>
<td>14%</td>
<td>18%</td>
</tr>
<tr>
<td>Cost</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>Not having symptoms/Symptoms went away*</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td>Not important to take every time</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Dosing (e.g. have to take too often)</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Social issues (e.g. work/school conflict)</td>
<td>2%</td>
<td>2%</td>
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<tr>
<td>Administration (e.g. hard to swallow)</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Difficulty getting transportation to get meds</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Complexity of medication (e.g. confusing)</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Saving pills for later</td>
<td>N/A</td>
<td>6%</td>
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</table>

*Statistically Significant Difference*
### Reasons for non-adherence: Chronic condition by condition

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total</th>
<th>Asthma</th>
<th>Blood Pressure</th>
<th>High Cholest.</th>
<th>Diabetes</th>
<th>Depression</th>
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<tbody>
<tr>
<td>Forgot/Did not have pills with me</td>
<td>48%</td>
<td>45%</td>
<td>49%</td>
<td>51%</td>
<td>48%</td>
<td>55%</td>
</tr>
<tr>
<td>Side effects</td>
<td>14%</td>
<td>19%</td>
<td>11%</td>
<td>12%</td>
<td>11%</td>
<td>24%</td>
</tr>
<tr>
<td>Cost</td>
<td>8%</td>
<td>20%</td>
<td>6%</td>
<td>7%</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>Not having symptoms/Not sick</td>
<td>8%</td>
<td>15%</td>
<td>5%</td>
<td>3%</td>
<td>6%</td>
<td>9%</td>
</tr>
<tr>
<td>Not important to take every time</td>
<td>7%</td>
<td>14%</td>
<td>5%</td>
<td>4%</td>
<td>3%</td>
<td>10%</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>7%</td>
<td>8%</td>
<td>5%</td>
<td>5%</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>Dosing (e.g. have to take too often)</td>
<td>3%</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Social issues (e.g. work/school conflict)</td>
<td>2%</td>
<td>3%</td>
<td>2%</td>
<td>1%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Administration (e.g. hard to swallow)</td>
<td>1%</td>
<td>3%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Difficulty getting transportation to get meds</td>
<td>1%</td>
<td>3%</td>
<td>0%</td>
<td>1%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Complexity of medication (e.g. confusing)</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
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Q12. What are the primary reasons you have ever stopped taking or changed the way you take your prescription medication(s)?

(Asthma: n=120/Blood Pressure: n=5487/High Cholest.: n=480/Diabetes=148/Depression: n=209)
### Reasons for non-adherence: Chronic condition by region

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total</th>
<th>ROC</th>
<th>CNY/ST</th>
<th>UTA</th>
<th>WNY</th>
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</thead>
<tbody>
<tr>
<td>Forgot/Did not have pills with me</td>
<td>48%</td>
<td>50%</td>
<td>46%</td>
<td>47%</td>
<td>49%</td>
</tr>
<tr>
<td>Side effects</td>
<td>14%</td>
<td>12%</td>
<td>14%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Cost</td>
<td>8%</td>
<td>7%</td>
<td>6%</td>
<td>16%</td>
<td>8%</td>
</tr>
<tr>
<td>Not having symptoms/Not sick</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Not important to take every time</td>
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<td>6%</td>
<td>7%</td>
<td>9%</td>
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<tr>
<td>Effectiveness</td>
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<td>8%</td>
<td>6%</td>
<td>9%</td>
<td>5%</td>
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<tr>
<td>Dosing (e.g. have to take too often)</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Social issues (e.g. work/school conflict)</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>Administration (e.g. hard to swallow)</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>Difficulty getting transportation to get meds</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Complexity of medication (e.g. confusing)</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Q12. What are the primary reasons you have ever stopped taking or changed the way you take your prescription medication(s)?
(ROC: n=368/CNY: n=377/UTA: n=197/WNY=302)
Respondents taking a medication for a chronic condition primarily rely on themselves to make sure medication is taken as prescribed.

![Bar chart showing persons involved with medication adherence]

Q14./Q29. Who is involved in helping you make sure you take your medication as prescribed by your doctor? (n=1,244 / n=103)

- No one helps me with making sure I take my medication: 69% (Chronic condition), 77% (Antibiotic (those with chronic condition))
- My partner/spouse: 13% (Chronic condition), 16% (Antibiotic (those with chronic condition))
- My doctor: 3% (Chronic condition), 2% (Antibiotic (those with chronic condition))
- My pharmacist: 3% (Chronic condition), 2% (Antibiotic (those with chronic condition))
- Another family member: 1% (Chronic condition), 2% (Antibiotic (those with chronic condition))
- Other: 1% (Chronic condition), 1% (Antibiotic (those with chronic condition))
To ensure they take their medication as directed, most respondents fit it into their daily routine and many rely on a pill box.

Q15./Q30. Which of the following methods, if any, do you use to help you take your medication as prescribed? (n=1,244 / n=103)
The majority of patients trust their doctors to act in their best interest and feel comfortable discussing missed medications.

**Agreement – Top 2 box**

- **I trust my doctor to make decisions that are best for me**
  - Chronic condition: 85%
  - Antibiotic: 88%

- **I feel comfortable telling my doctor when I miss taking my medications**
  - Chronic condition: 78%
  - Antibiotic: 76%

- **I am fearful of my doctor's reaction if I tell him that I did not take my medications as prescribed**
  - Chronic condition: 7%
  - Antibiotic: 14%

- **My doctor spends a lot of time talking to me about my condition(s) and treatment**
  - Chronic condition: 57%
  - Antibiotic: 57%

Q17./Q32. Please indicate how much you agree or disagree with the following statements. (n=1,244 / n=257)


