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Executive Summary

A survey was conducted of all local sections and the results of that survey were compiled into leading and lagging metrics to measure the health of the sections. Using statistical analysis, the leading and lagging metrics indicated that there is a strong correlation between sections of certain member sizes. Those groups are small (<100), medium (101-200), large (201-300), and extra-large (>300).

The 2015 data showed that there has been a slight improvement in AIChE's local sections' programs overall despite having fewer members join local sections. In comparison to 2014's data, across the board, sections of each size saw lower lagging metrics indicating that there are fewer things to be concerned about within the section. Small, medium and large local sections all saw steady or slightly improved leading metrics in 2015 showing that there are more positive things happening within local sections to support their overall health. The ratio of leading to lagging metrics improved between 2014 and 2015 for sections of all sizes meaning better health of local sections in 2015.

In 2015, communications with members (via social media and regular newsletters) continued to be lagging amongst local sections. It was also shown that having more Young Professionals involved in a local section resulted in a stronger and healthier local section, especially for large and extra-large local sections. Small local sections had greater lagging metrics than larger-sized local sections. The data also depicted that the correlation between metrics decreases as section size gets smaller.

Based on these findings, the Local Sections Committee (LSC) has decided to focus its support on improving the lagging metrics across all sizes of local sections while local section leadership should focus on continued growth of their leading metrics. Additionally, focus should be toward supporting small and medium sized sections, while reducing number of calls with extra-large and large sections. Finally, the LSC should reach out to all lagging local sections individually to determine support needs.

Moving forward the LSC will continually evaluate the Annual Report with regard to feedback from these groups in order to improve the report as needed.

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1 Introduction

Local Sections (LS) are instrumental for the success of AIChE as an organization because of their potential to exhibit the numerous benefits that come with being part of the Institute in a more frequent and personal way. Furthermore, the members of these sections can serve as a talent pool for crafting a new generation of leaders for our Institute.

In 2014, a systematic and sustainable methodology was developed to measure of the health of the local sections. The survey and analysis helped to identify areas for supporting the LS executive boards in addition to measuring performance of initiatives and programs across AIChE.

Primarily, the health of LS depends on its ability to:

1. Remain organized at the board level.
2. Remain relevant to its members.
3. Remain financially stable.
4. Recruit new members.
5. Maintain healthy member involvement.

Based on these above criteria, the 2014 Recommendations Report of the AIChE President's Blue Ribbon Task Force on Local Sections (BRTFLS) defines the two major categories of metrics as follows:

Leading metrics: Performance indicators that peak before a local section declines and bottoms before a local section improves. Having a high leading metric indicates a healthy local section, while a low leading metric means there is room to improve.

Lagging metrics: Performance indicators that peak after a local section declines and bottoms after a local section improves. Having a high lagging metric indicates there is room to improve within the local section and a low lagging metric indicates a healthy local section.

Despite the generality of these metrics, not all sections can be measured the same way. There are many factors that affect operations of the section, i.e. number of members, industry type and diversity, geographic extension, presence of other professional societies, etc. These considerations add another dimension of variability to any comparison of local sections. Nevertheless, the vitality of each section depends on its leaders and their creativity to advance our profession in all its shapes and forms.

In order for the Annual Report to be effective and beneficial in accomplishing the goal of making AIChE a data-driven organization, continued data collection made priority in 2015 as well. As was performed in 2014, diligent data collection and analyses were used in 2015 to ensure that the leading and lagging metrics can be used to predict the bottom/peak of a local section and that the AIChE Local Sections Committee can render assistance as and when necessary. The sections had 30 days to complete the online survey. LSC encouraged all sections via email to answer the survey.

This report highlights the methodology created and used for developing metrics and the survey in both 2014 and 2015. It continues with the analysis of the data obtained through the annual survey and its comparison of results to 2014's data. Based on the 2015 data analysis, recommendations for improving the health of Local Sections and future annual surveys are then discussed. Most importantly, the sections' health is compared to the results from the year 2014. Finally, future work for advancing the annual survey is described so as to make the analysis and data-collection effort more effective.

2 Methodology

2.1 Question Development

BRTFLS provided a bank of potential questions for the survey based on target areas recognized by the Institute and from information exchanged with other professional organizations. In addition, some other questions were formulated with the insight of local sections leaders.

The question selection was based on three major considerations.

- 1) To have questions simple enough so that sections leaders could answer easily and/or LSC could gather data from existing databases.
- 2) The answers must be able to be translated into numerical values in order to perform statistical analyses to assess the health of the local sections.
- 3) The questions had to address the following 5 focus areas:
 - Organization
 - Media Outreach
 - Member Involvement
 - Demographics
 - Finance

2.2 Survey

Fifteen closed-ended questions were identified and used in 2014. All questions were sent to section leadership to gather statistical data that will measure the performance of each section's leading and lagging metrics or by peer comparison. Furthermore, these questions make it possible to evaluate sections against past performance in the recurring surveys. An additional open-ended question is included in order to capture subjective input from each LS. The proposed survey questions are presented in Table 1 on the next page.

Table 1. Proposed survey. Sections 1-5 will be filled by sections' leaders. Data for Section 6 will be collected from LSC current databases.

#	Category	Description	Answer Choices	Metric Type
1.1	Organization	Did the section hold officer elections in accordance with the LS's by-laws?	Yes/No	Leading
1.2	Organization	Based on required officer positions detailed in your by-laws, what percent of all officer and board member positions were not filled?	0-100%	Leading
1.3	Organization	Are one or more of the elected officers repeating terms? If so, what is the average number of repeat terms?	Number	Leading
1.4	Organization	Did your section file a local section annual report within the last two years?	Yes/No	Leading
1.5	Organization	Does your section fill a treasurer's report according the specific section requirements?	Yes/No	Leading
1.6	Organization	What percent of Local Sections Committee monthly meetings did the section call in to?	0-100%	Leading
2.1	Media	Does the section operate and maintain an up-to-date webpage?	Yes/No	Leading
2.2	Media	Did the section publish a newsletter (physical or digital) periodically in the last year?	Yes/No	Leading
2.3	Media	Does the section actively maintain a social media presence for communications, advertising, event info etc.?	Yes/No	Leading
3.1	Involvement	Did the section attend the Local Section Leadership Workshop meeting within the last two years?	Yes/No	Leading
3.2	Involvement	Did the section conduct any activity with student chapters in its area within the last year?	Yes/No	Leading
3.3	Involvement	Does the section have a Young Professionals group?	Yes/No	Leading
3.4	Involvement	Does your section wish to be contacted about improving Young Professional involvement in your local section?	Yes/No	
4.1	Demographic	How many TOTAL members does the section currently have?	Open Ended	Lagging
4.2	Demographic	What percent of total members are LOCAL section members ONLY?	0-100%	Lagging
4.3	Demographic	What percent of the section's board of directors/executive committee is less than 35 yrs of age?	0-100%	Lagging
5.1	General	Please describe the current and future state of your local section. Feel free to provide more details on any of the above responses	Open Ended (insight)	
6.1	Demographic	Within each section's geographic area, what percent did AIChE memberships (not LS memberships) change between 2014 and 2015?	-100-100%	Lagging
6.2	Demographic	What percent did local section membership change in the last year (2014 vs. 2015)?	-100-100%	Lagging

The rationale of each question and brief descriptions of the algorithm used to evaluate the data input are provided on the next page.

2.2.1 Organization

- Questions 1.1 through 1.6 all deal with the performance of a section's organizational structure. This set of questions is characterized as a leading metric since they are indicative of a section's capacity for operating smoothly.
- In addition to numerical values, if answers to these questions involve a 'Yes' or a 'No', a score of 0.5 or 0 is awarded respectively.
- A higher score is indicative of a section that is functioning efficiently and is improving and a lower score indicates a section that is struggling with this metric.

2.2.2 Media

- Questions 2.1 through 2.3 deal with media activities and active presence.
- All responses in this section will be awarded a score of 0 (No) or 0.5 (Yes).
- This is a leading metric because a low score is indicative of a section that is weak in this area and a higher score is indicative of a section that is active in their outreach effort.

2.2.3 Involvement

- Questions 3.1 through 3.3 depict a local section's participation in community and AIChE activities.
- All responses in this section will be awarded a score of 0 (No) or 0.5 (Yes).
- This is a leading metric because a low score is indicative of a section that is struggling with engaging niche groups and its visibility with AIChE's home office, and a high score is indicative of a section that handles these tasks well.

2.2.4 Demographics

- Questions 4.1, 4.2, 4.3, 6.1, and 6.2 deal with the demographics of the local sections and is a major lagging metric. Since a lagging metric MUST meet the above definition, scoring of these questions need to be handled differently.
- 4.1 is open ended, but the number of members is first used to determine what percent of the TOTAL members belong to that section. Next, the percent for a given section is compared to the maximum percent among all sections. For example, if two sections have 5 and 10 members, the proportions belonging to each section are 0.33 and 0.67 respectively. The final metric score will be $0.67 - 0.33 = 0.34$ and $0.67 - 0.67 = 0$. This indicates that section A has a higher lagging metric than B.
- Questions 4.2 and 4.3 are scored using the same rationale. Based on the percent entered, each section receives a score between 0 and 1 that is found as follows: (1-proportion entered). This method of scoring will ensure that sections exhibiting low numbers will receive higher lagging metric scores.
- Questions 6.1 and 6.2 are scored slightly differently than question 4.1 through 4.3 in order to accommodate negative numbers. The calculation is done exactly as in question 4.1, but this time a section can be awarded a lagging score of greater than 1. This method is very helpful because it immediately indicates when a section has LOST members (score greater than 1). For example, a section loses 30% of its members then the lagging metric will be $(1 - (-0.3))$ or 1.3. If the section gains 15%, then the lagging metric will be $(1 - 0.15)$ or .85. So the more members a section gains the less of a lagging factor will be.

3 Results and Discussion

3.1 Overview of Local Sections

In order to begin the analysis of the data, local sections around the country were grouped based on their sizes; the reason being that it would be statistically unfair to compare the performance of a large section that has more resources and funding, to that of a smaller section that may be facing budgetary and organizational constraints. Breaking down the sections based on their size also makes it easier to make recommendations for improvement.

Based on pre-determined size classes, the sections were broken down into Small, Medium, Large and X-Large sections. The size allocation and section distribution of these groups can be seen in Figure 1. Almost 50% of the local sections have fewer than 50 members.

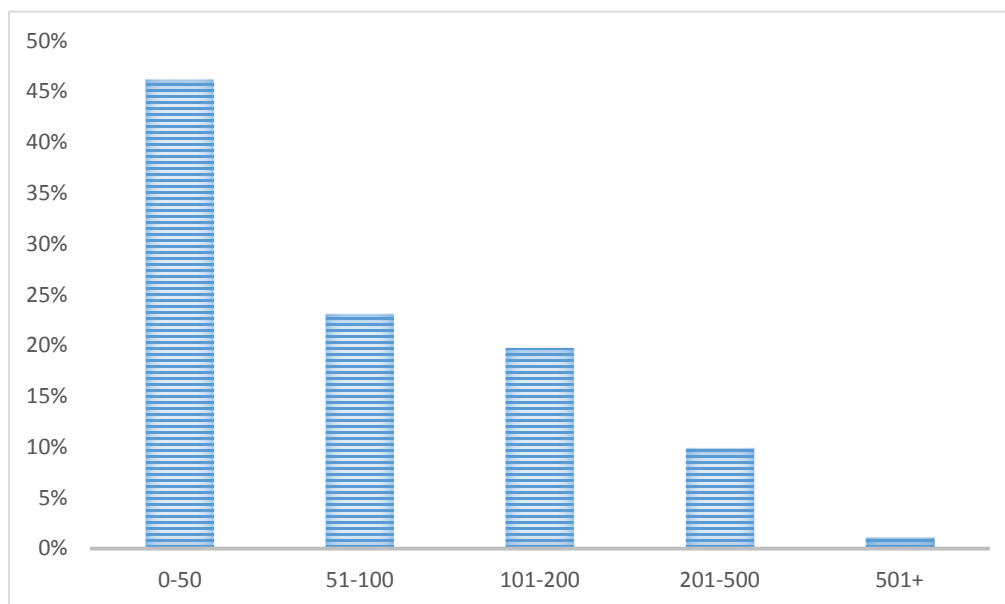


Figure 1. Percent of all local sections by membership size.

3.2 Survey Participation

The reduction in complexity and length of the survey as compared to previous versions of the survey resulted in 74% of sections responding in 2015, a three percent improvement from 2014. While the number of responses could have been higher, it is the highest seen in recent years. This is worth mentioning because in order for AIChE to make effective recommendations and effect changes, it must be aware of the health of as many local sections as possible. In addition, those sections who have not participated the last few years will be contacted in hopes of improving participation numbers even more for 2016.

3.3 General Findings

Figure 2 below highlights the noteworthy responses acquired during the survey. The questions highlighted below serve as performance indicators of all sections as whole and their abilities to liaise with AIChE as well as their members.

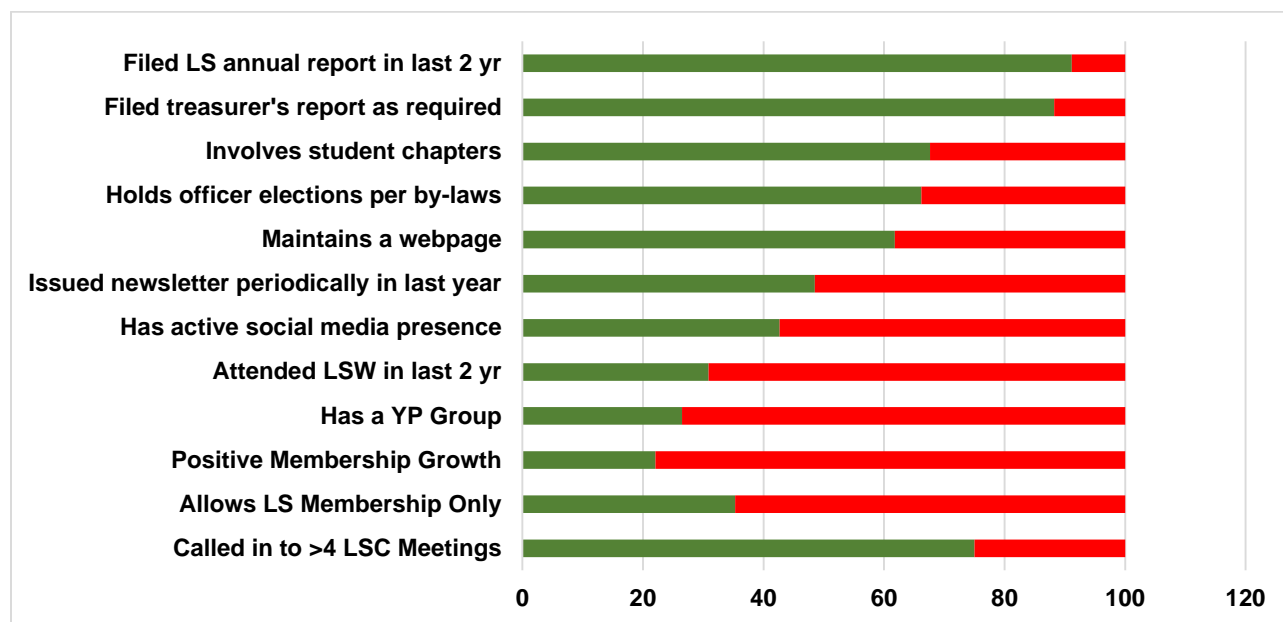


Figure 2: General Survey Responses

Out of all local sections, a relatively small number (26%) reported to have Young Professionals (YP) groups. This statistic remained relatively unchanged from 2014 and as such more effort is needed to make AIChE as an organization accessible to young professionals. Approximately 43% of sections indicated they maintain active social media presences. In a day and age when social media seems pervasive, a lack of social media presence could have an impact on the engagement of YP within local sections. Communications via newsletter seem to be also lagging the same way as the electronic outlets with 49% of sections reporting that they distribute newsletters. It is worth noting that both these metrics saw three percent increases from the previous year.

3.4 Results per Group Bin

As mentioned before, the number of members in a section is a major contributing factor to involvement.

3.4.1 Leading and Lagging Metric Distribution

Based on the size distributions of the sections, the leading and lagging of all sized sections were determined using the aforementioned criteria. Figures 3 through 6 depict the leading and lagging metric values for each section compared to peers of the same section size and the

average leading and lagging metrics of those sized sections. It must be highlighted that the variance of the lagging and leading metrics is inversely proportional to the size of section. The data is more scattered around the average metric for sections of smaller size, while the data is more uniform for larger sections. This indicates that the smaller sections operate in different circumstances making it harder to generalize performance amongst their peers as opposed to the larger sections, which seem to operate in more similar circumstances.

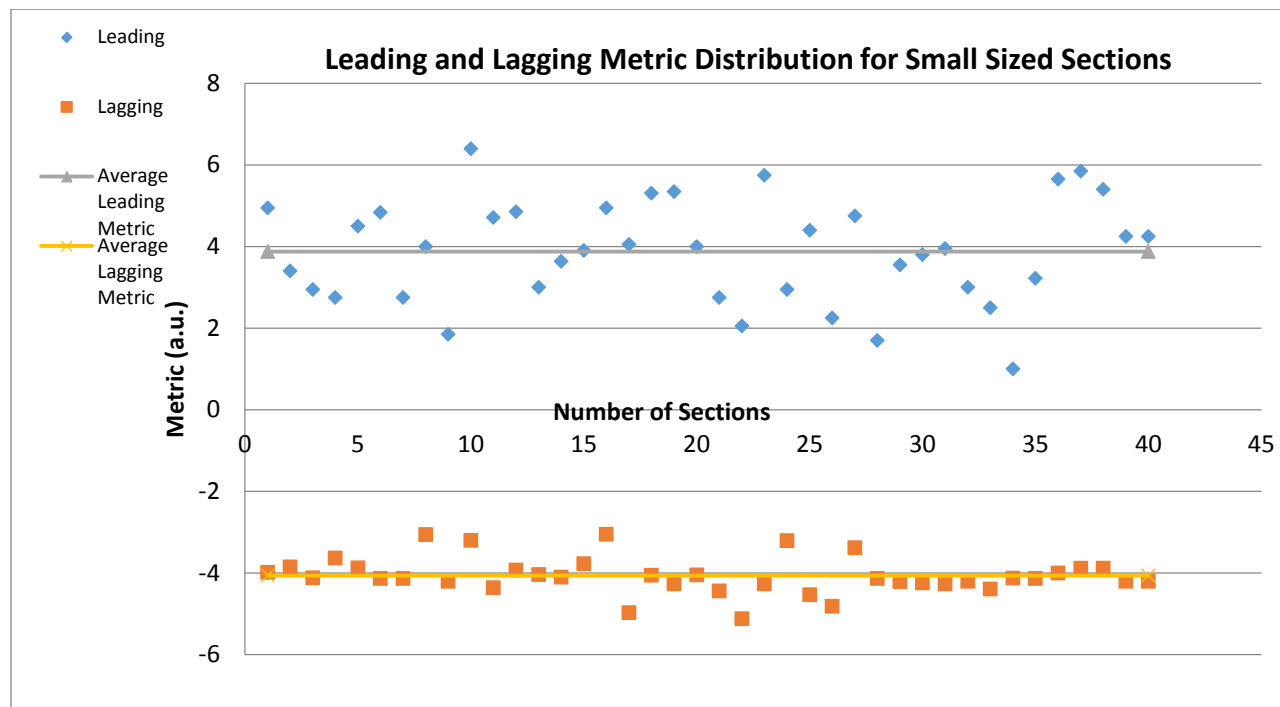


Figure 3. Leading and Lagging Metric Distribution for Small Sized Sections.

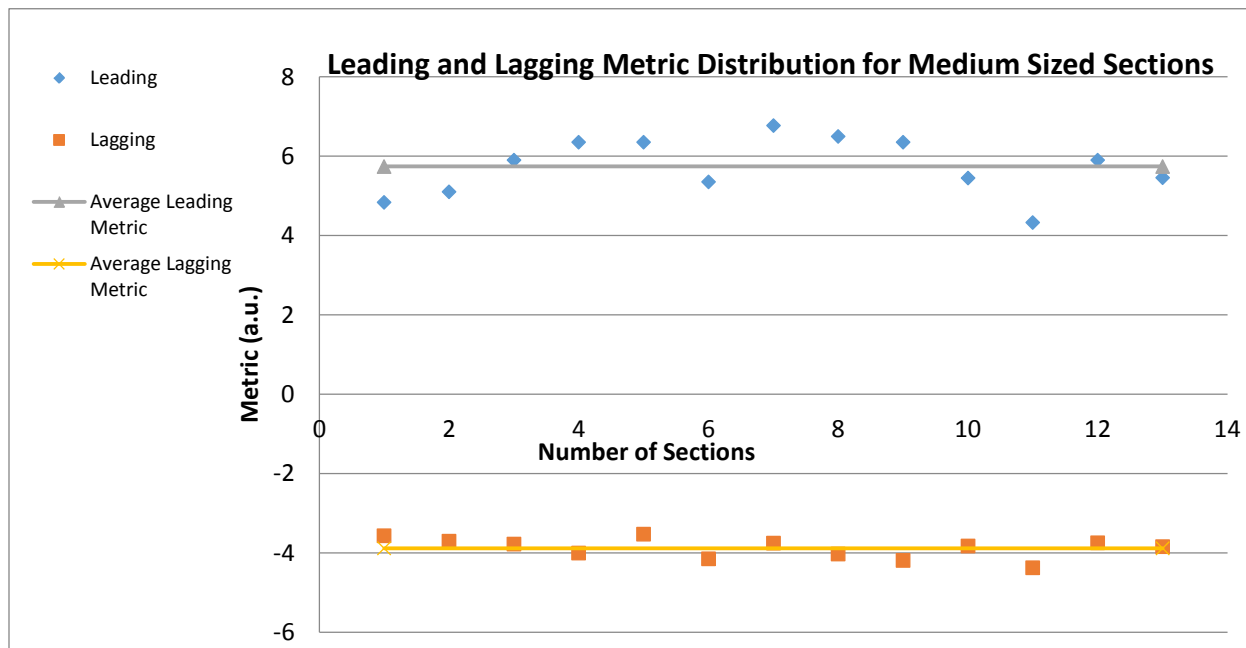


Figure 4. Leading and Lagging Metric Distribution for Medium Sized Sections.

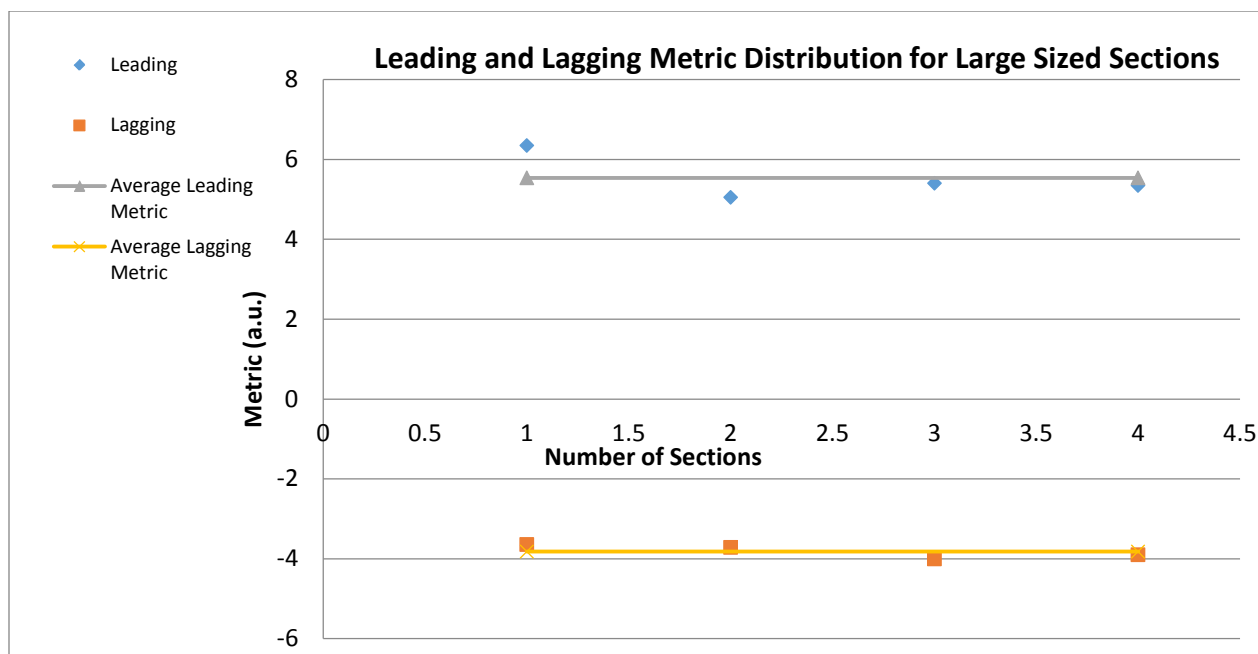


Figure 5. Leading and Lagging Metric Distribution for Large Sized Sections.

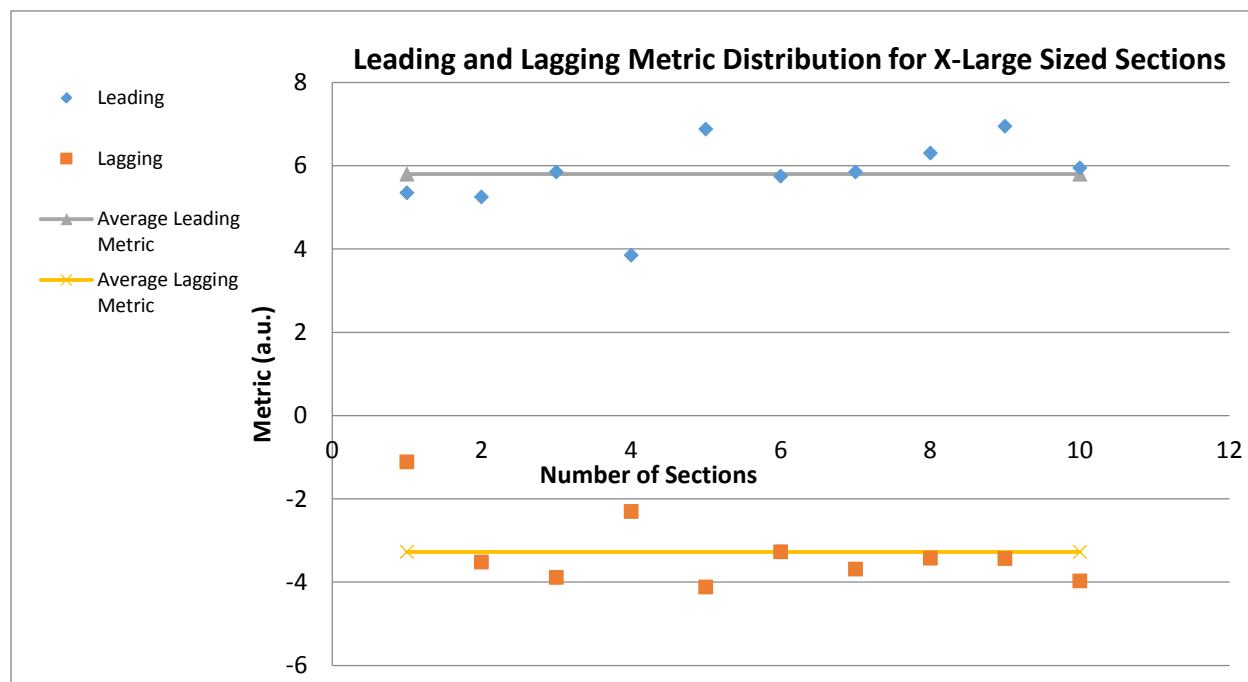


Figure 6: Leading and Lagging Metric Distribution for X-Large Sized Sections.

3.5 Discussion of Overall Metric Trends

In order to better analyze the trends seen amongst sections, the average leading and lagging metrics for each of the four groups were plotted and the results can be seen in Figure 7 on the next page.

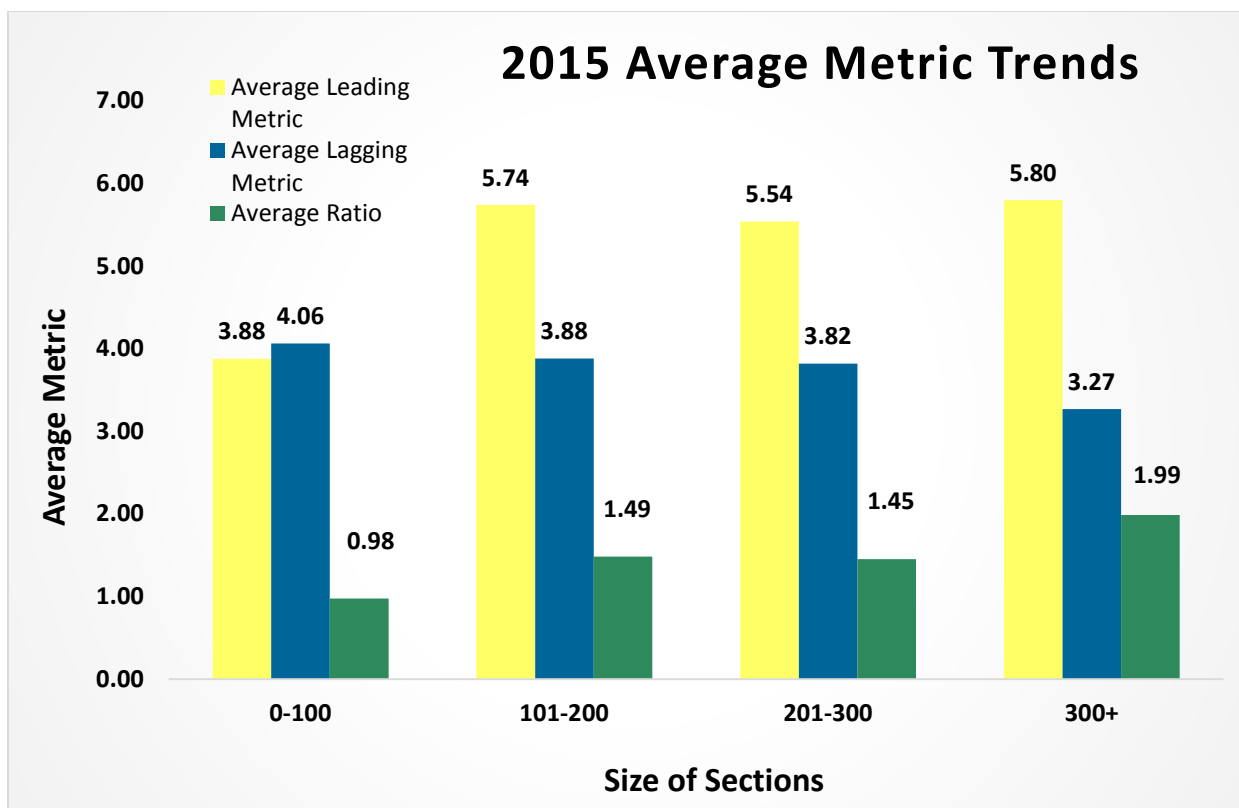


Figure 7: Average Metric for Each of the Four Groups

While the graphs from the previous pages provide valuable insight into the overall health of local sections (with the use of a small number of survey questions), further analysis is needed to determine meaningful correlations, and causations, that exist between particular questions in the survey.

Multiple regression analyses were performed on the responses within each of the four groupings and R^2 values of greater than |0.5| were considered significant. It should be noted that meeting this criteria does not imply that two questions are in any way related; all correlations do not imply causation.

It is very noticeable that the more correlations between pairs of metrics occur for larger sections. This suggests that the questions posed in this survey more adequately capture the behavior of larger sections and in order for more correlations to become evident in smaller sections, a more unique set of questions must be posed. These new sets of questions must account for the unique financial and organizational situations of smaller sections thereby enabling the Local Sections Committee to gain as much insight into the behavior of smaller sections as they do with larger sections.

While there were many correlations observed, only the ones that depicted cause and effect relationships were identified.

Major conclusions from 2015's data and analysis are:

- Strong correlations between metrics in XL sections. Most of these are related to strong leadership, participation with LSC, and the number of volunteers that the XL sections have to fulfill functions that result in leading metrics.
- For XL sections, having more YPs involved results in higher leading metrics.
- It is clear that these strong correlations weaken as the sections get smaller, including if there is YP involvement.
- Local Section membership numbers dropped overall (-6% avg.)

Three major conclusions from 2014 are also still valid:

- 1) The lagging metrics are INDEPENDENT of the size of the section, meaning the metric is not affected by the size of the section.
- 2) The leading metrics are DEPENDENT of the size of section meaning these metrics change as the size of a section changes.
- 3) Based on (1) and (2), it logically follows then that the ratio of the leading/lagging metrics are DEPENDENT of the size of a section with larger sections exhibiting better overall health.

These major conclusions are consistent with last year's data and are a good indication that lagging metrics can be addressed more broadly across all sections while leading metrics should be addressed based on the section's size. This means the committee and AIChE should create broad programs open to all sections based on lagging metrics while at the same time create specific programs based on section size on leading metrics. In addition, it appears that a top down approach works best for lagging metrics while the opposite would be true for leading metrics. Meaning that AIChE and the committee should be more aggressive in improving the lagging metrics either by programs, grants, resources, or improved communication with local sections while local section leadership should be more aggressive in addressing the leading metrics in much the same way with their local members.

It should be mentioned that new local sections will have higher lagging metrics as they get themselves off the ground. If this is your section's first few years of existence, consider this year's metrics as a benchmark to continually improve upon.

As more data is gathered from repeating this survey, better conclusions could be drawn from this type of analysis.

3.6 Open-ended Questions

The responses to the open-ended questions were also analyzed to gain a general understanding of the health of local sections. The following responses were noted as the most prevalent.

- Difficult to get members to attend meetings
- Difficult to have YP's attend and participate

- Section is essentially inactive
- In need of volunteer leadership
- Section is stable
- Section has improved
- Section is involved with local student chapters

4 Comparison to 2014 Trends

The 2015 year was a year of marginal improvement for all AIChE local sections. Across the board, sections of each size saw lower lagging metrics indicating that there are fewer things to be concerned about within the section. Small, medium and large local sections all saw steady or slightly improved leading metrics in 2015 showing that there are more positive things happening within local sections to support their overall health. The ratio of leading to lagging metrics improved between 2014 and 2015 for sections of all sizes meaning better health of local sections in 2015. Figures 8 through 11 show the metric comparisons between 2014 and 2015 for local sections of each bin size.

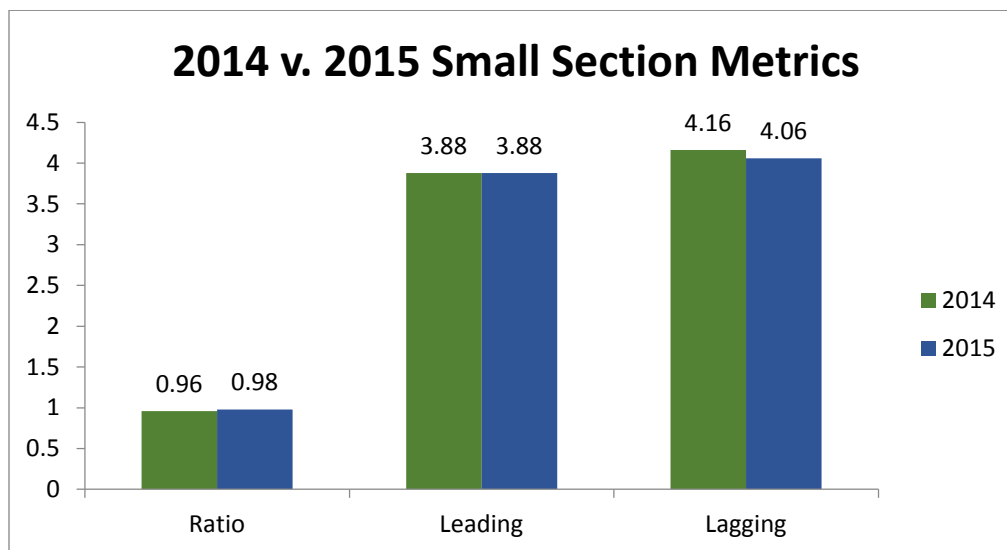


Figure 8: Annual metric trends for small local sections

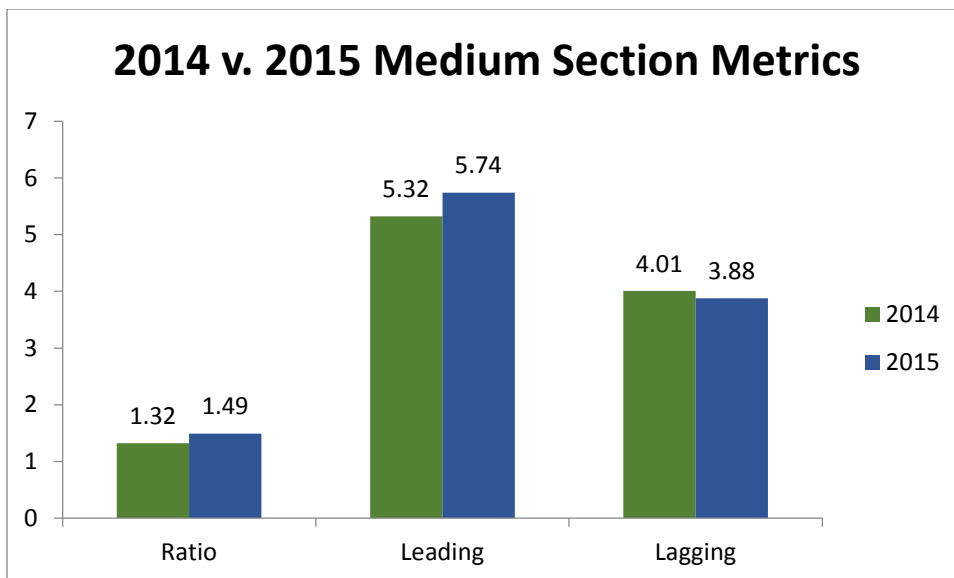


Figure 9: Annual metric trends for medium local sections

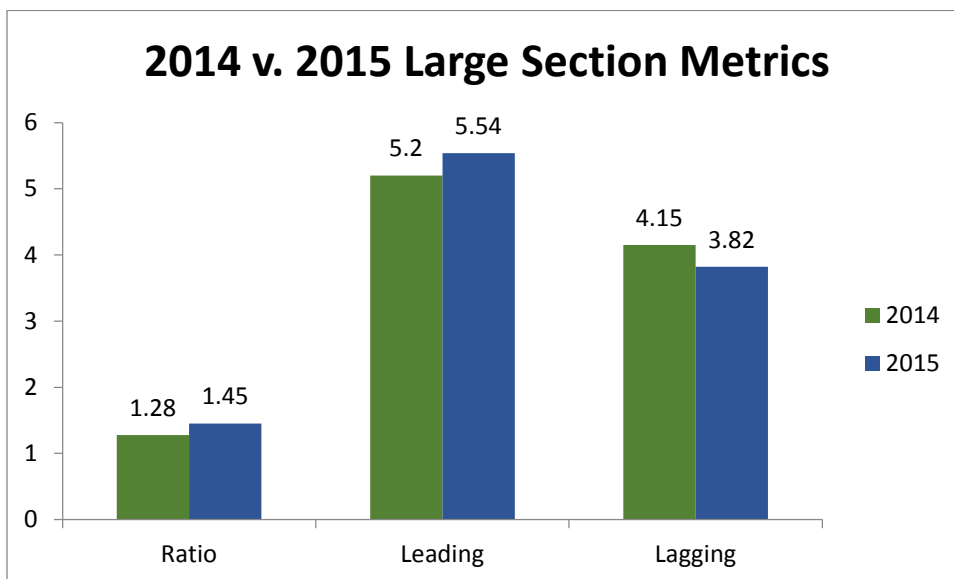


Figure 10: Annual metric trends for large local sections

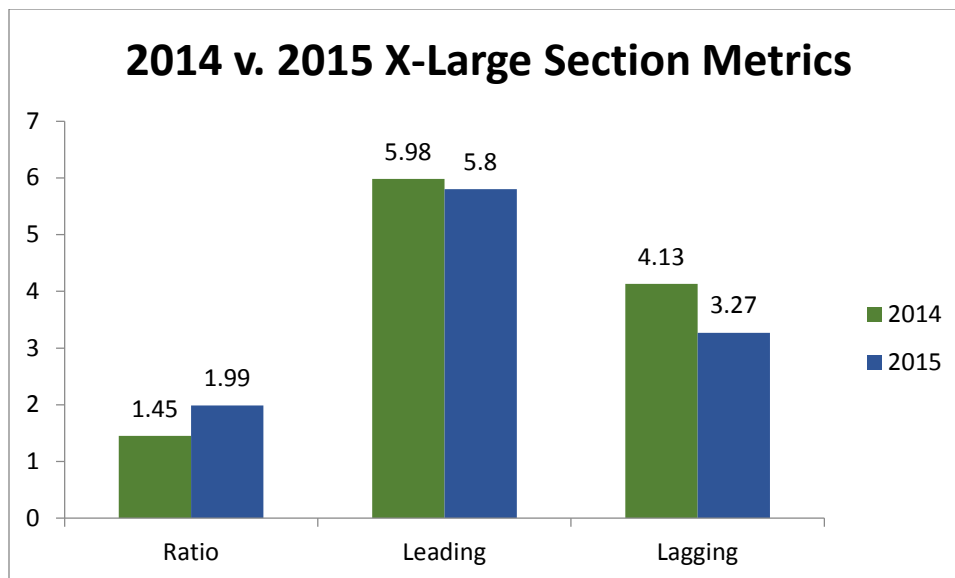


Figure 11: Annual metric trends for extra-large local sections.

5 2015 Recommendations

Based on the 2014 survey results, the AIChE Local Section Committee structured its services to the different types of sections to better cater to their specific needs and concerns. In particular, LSC acted on the recommendation that the Committee continue to update and revise the documentation for local leaders on the [Resources for Local Section Leaders webpage](#) from 2014 and continue to align volunteers for this task completion.

Additional action items obtained from 2015 survey can be listed as:

1. Reduce number of calls with XL and L sections so different meeting dates/times can be offered to encourage participation. Only approach XL and L sections that are lagging.
2. LSC should focus more heavily on small and medium sized sections.
3. It is likely that local industrial activity changes may be affecting the growth and operation of small and medium sections. It is recommended to correlate these factors to economic data and/or Institute's membership analyses.

Finally, similar to 2014 survey results, direct follow up with local sections with lagging overall metrics is recommended to determine on an individual basis the support needs of the section.

6 Looking Forward

In order for the Annual Report to be effective and beneficial in accomplishing the goal of making AIChE a data-driven organization, continued data collection must be made priority. Diligent data collection and analyses will ensure that the leading and lagging metrics can indeed be used to predict the bottom/peak of a local section and that the AIChE Local Sections Committee can render assistance as and when necessary. In order for the this survey exercise to embody the meaning of leading and lagging metrics as proposed by the BRTFLS, sustained responses from local sections are expected. The committee and AIChE staff will reach out to unresponsive sections to help improve the number of sections completing the survey.

In the coming years, the committee should judge how effective its programs and resources are for local sections based on the general lagging trends of all sections while section leaders should focus more on their leading metrics to see how effective their own local programs have been improving the participation of local members.

Each local section may use the leading and lagging metrics in order to measure the success of new and current initiatives over the years.

7 Acknowledgements

The Local Sections Committee would like to thank the following people who dedicated more than a year of their time reviewing the current local sections program and creating thoughtful recommendations to help improve the program as a whole. These recommendations were brought to the AIChE Board of Directors for consideration at the 2014 AIChE Spring Meeting. Many of these recommendations, including updating the Local Sections Annual Report, were approved.

Members of the 2014 AIChE President's Blue Ribbon Task Force on Local Sections

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Phil Westmoreland, 2013 AIChE President, Sponsor
Bette Lawler, Sponsor
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Defne Kayrak Talay, SIOC
Joe Deneault
Janet Werner

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Brian Daly, Local Sections Committee Chair
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Amanda Scalza, Local Sections Committee Secretary, Virtual Local Section

Thank you all for your commitment to AIChE and improving its local sections program!