INSTITUTE FOR SOCIAL RESEARCH • SURVEY RESEARCH CENTER
SURVEY RESEARCH OPERATIONS
UNIVERSITY OF MICHIGAN

Lunch and Learn - Dashboards and Reporting

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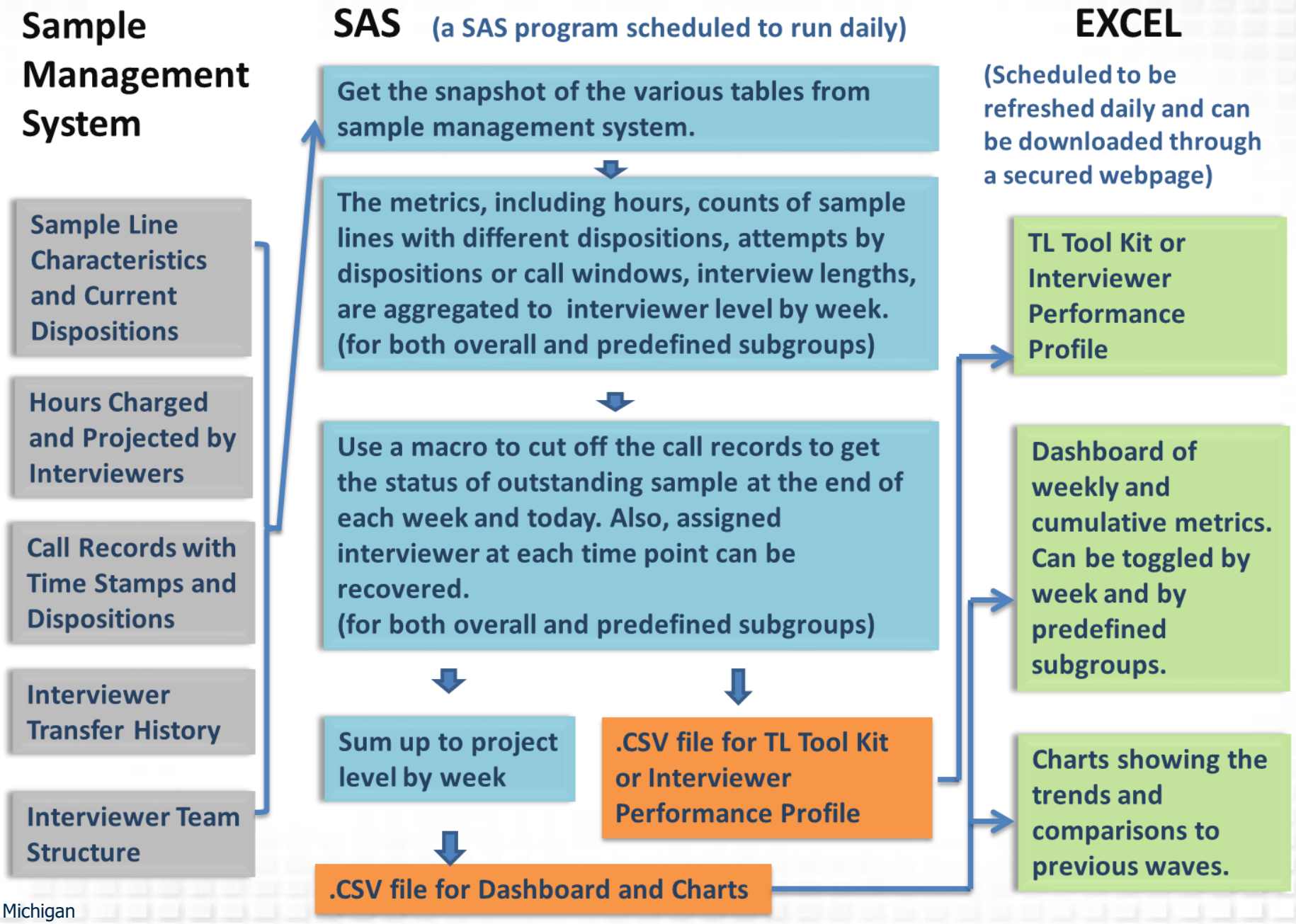
Stats Methods Unit

Dashboard : provide at-a-glance views of key performance indicator relevant to production monitoring

1. Excel Dashboard
- Currently used by NSFG, HRS and PSID
- Data Flow
- Design Features
    - Project Level Report
    - Interviewer Level Report

2. SSRS Dashboard
- Currently used by STARRS LS and preferred platform to be used for future MSMS studies
- Data Flow
- SSRS Platform Features
- STARRS LS Dashboard Design Features

Excel Dashboard Data Flow

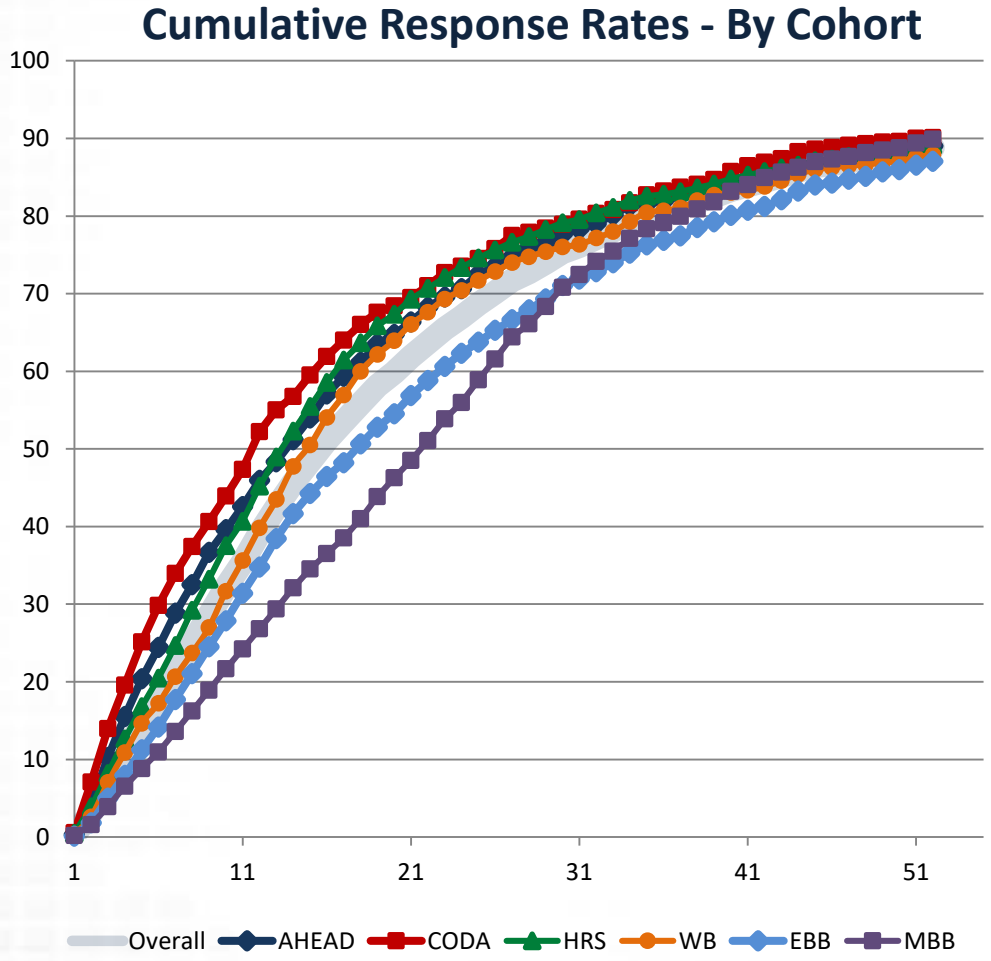


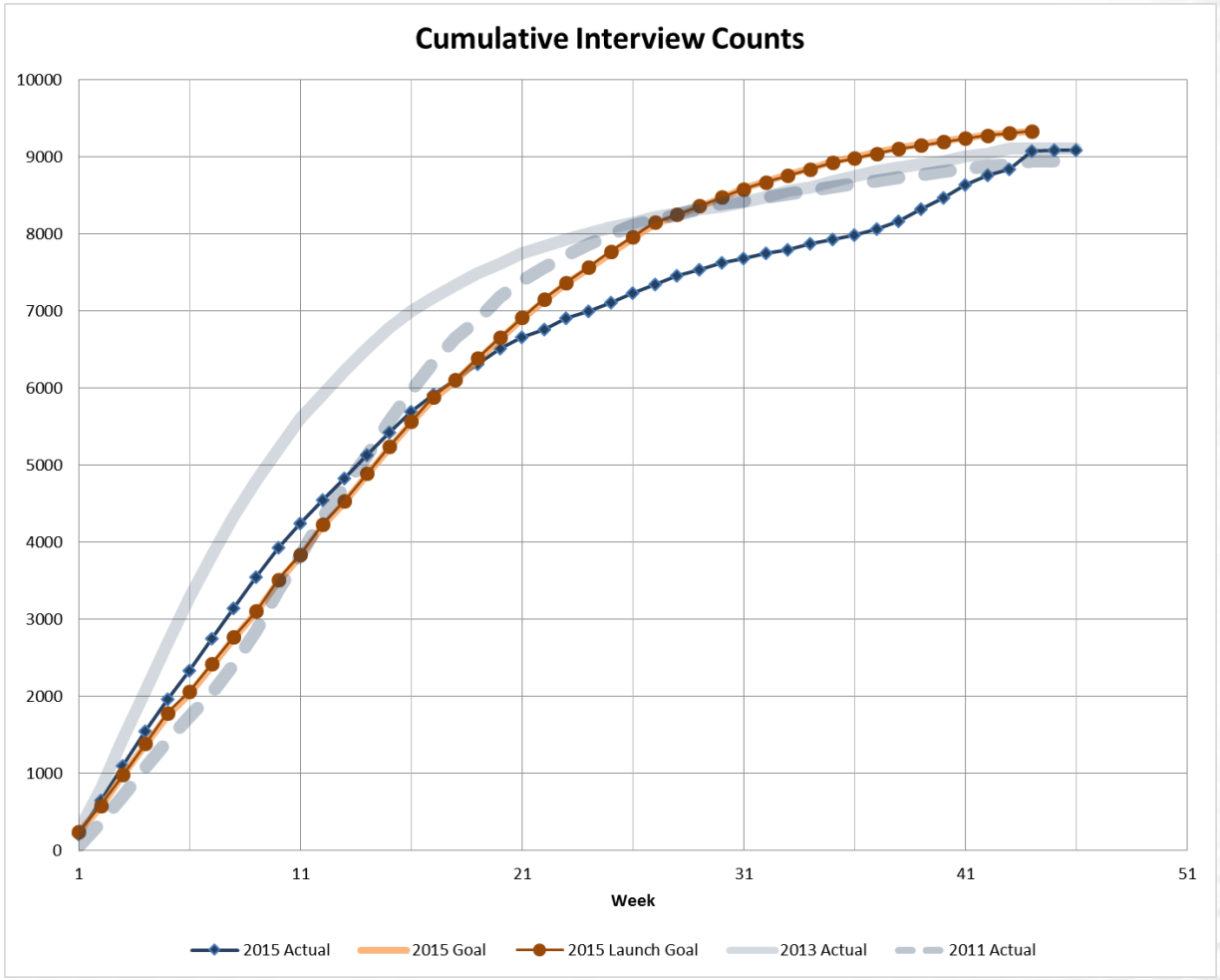
Dashboard – Project Level Report

- Front page (Snapshot) :
  - All metrics on one page
  - Daily (or Weekly) and Cumulative metrics
  - Screen and Main metrics
  - Multiple benchmarks for comparison
  - Toggle to different date/week
  - Toggle to different subgroups

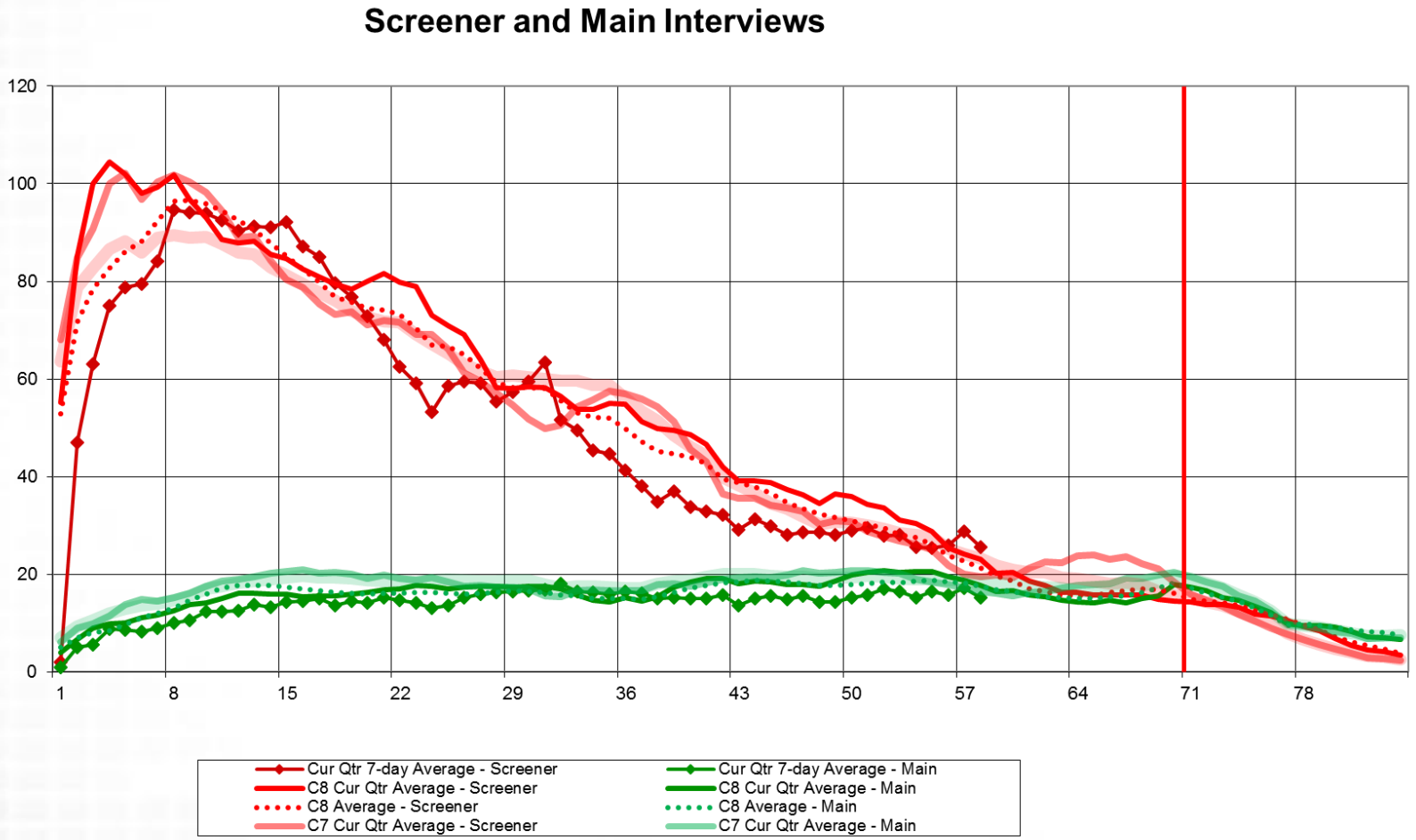
- Charts: Data visualization
  - Lines: progress/change with time
  - Bars:
    - Stacked Bars : proportion of hours by work type; proportion of calls by call window
    - Bar Chart with Negative Value: show the comparison to benchmark for multiple metrics
  - Charts that simultaneously display magnitude, direction and also the statistical significance of the metric
  - How to show the comparison to the benchmark when a chart is already busy

Line Chart - Cumulative Metric

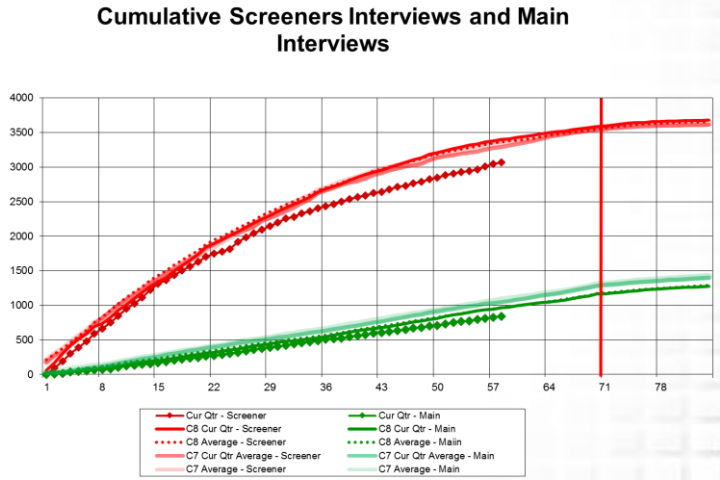




Line Chart – Daily Metric

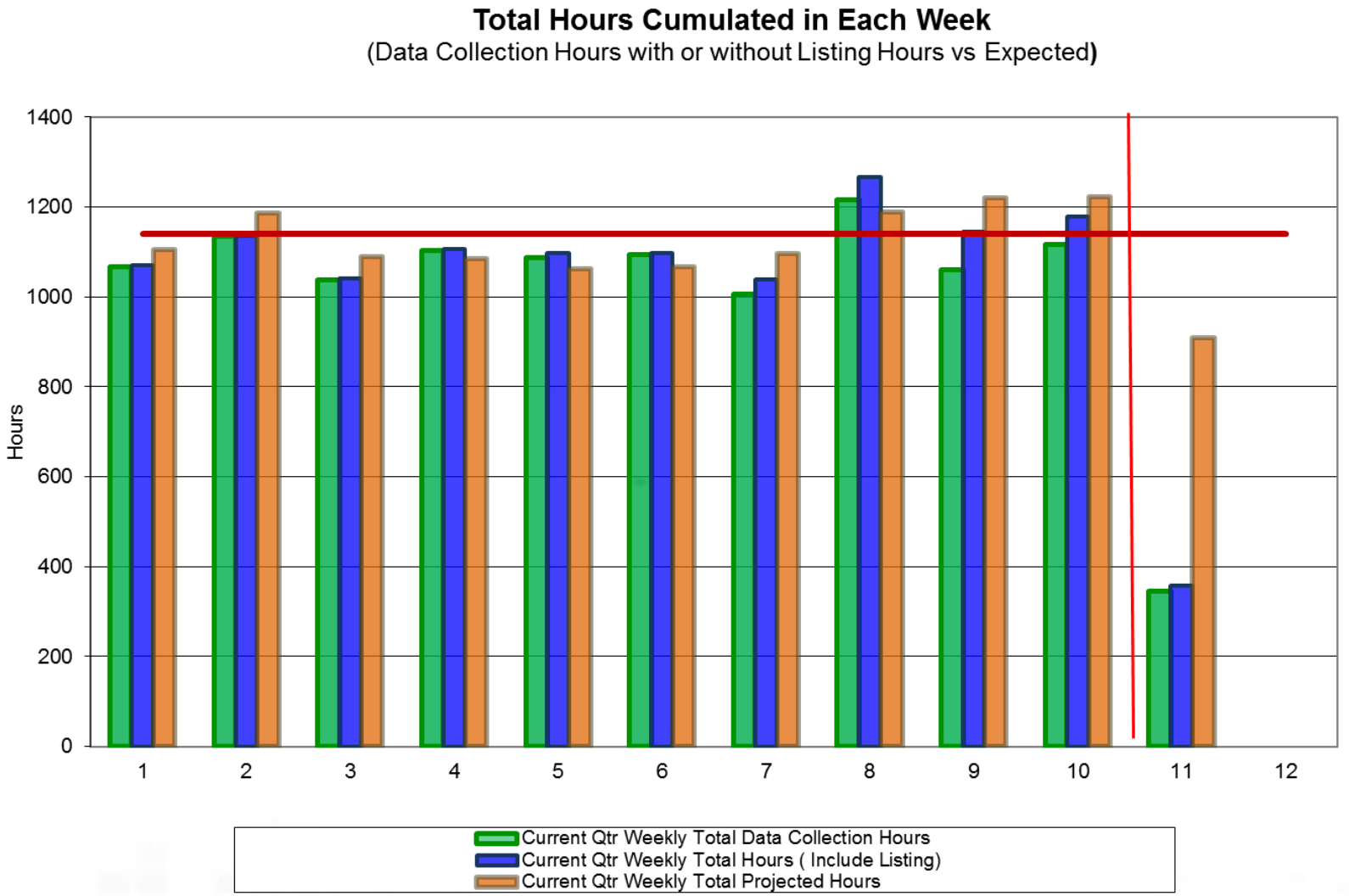


It's easier to see when the metrics deviated from the benchmark with weekly or daily metrics

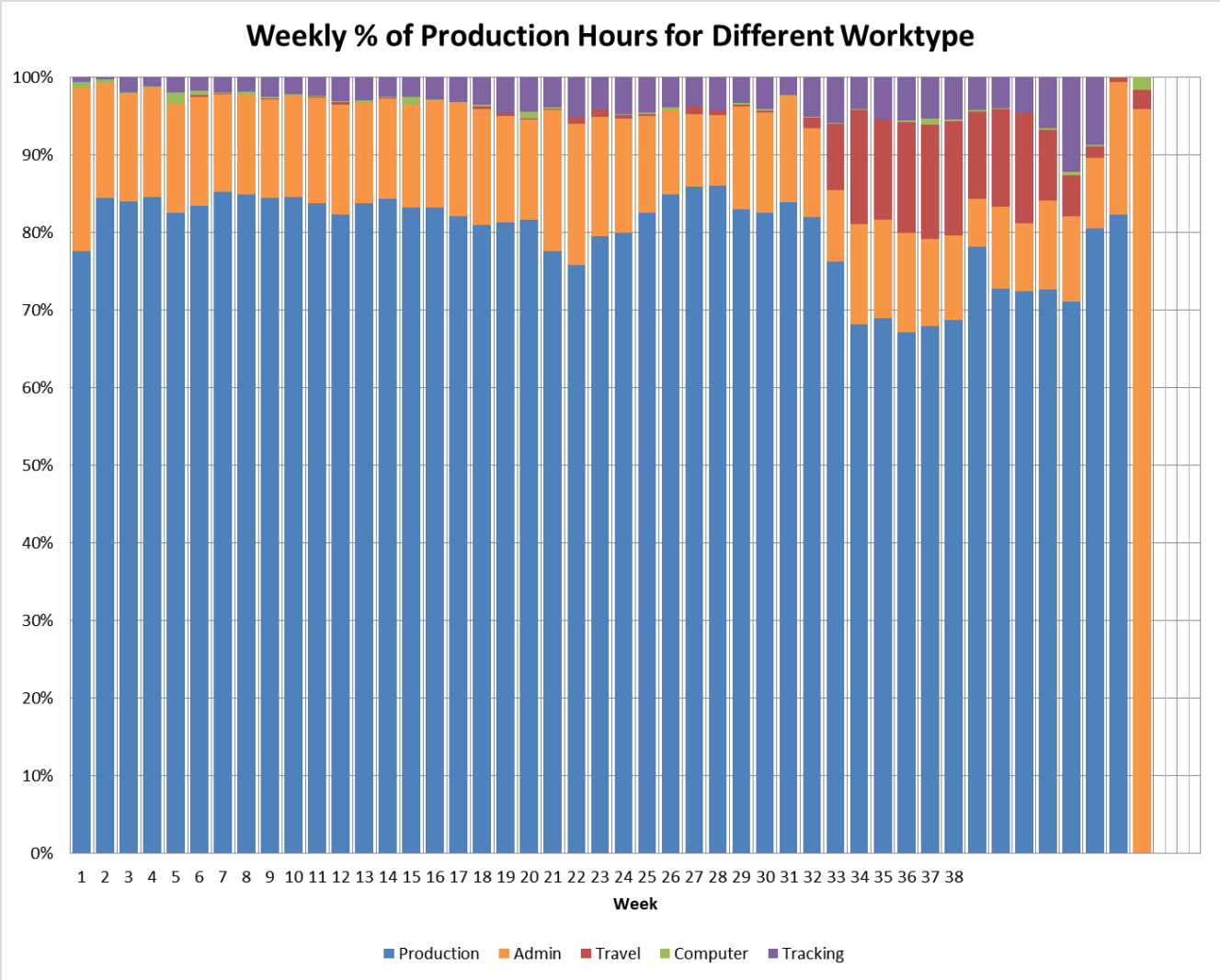


7-day average helps smooth the line

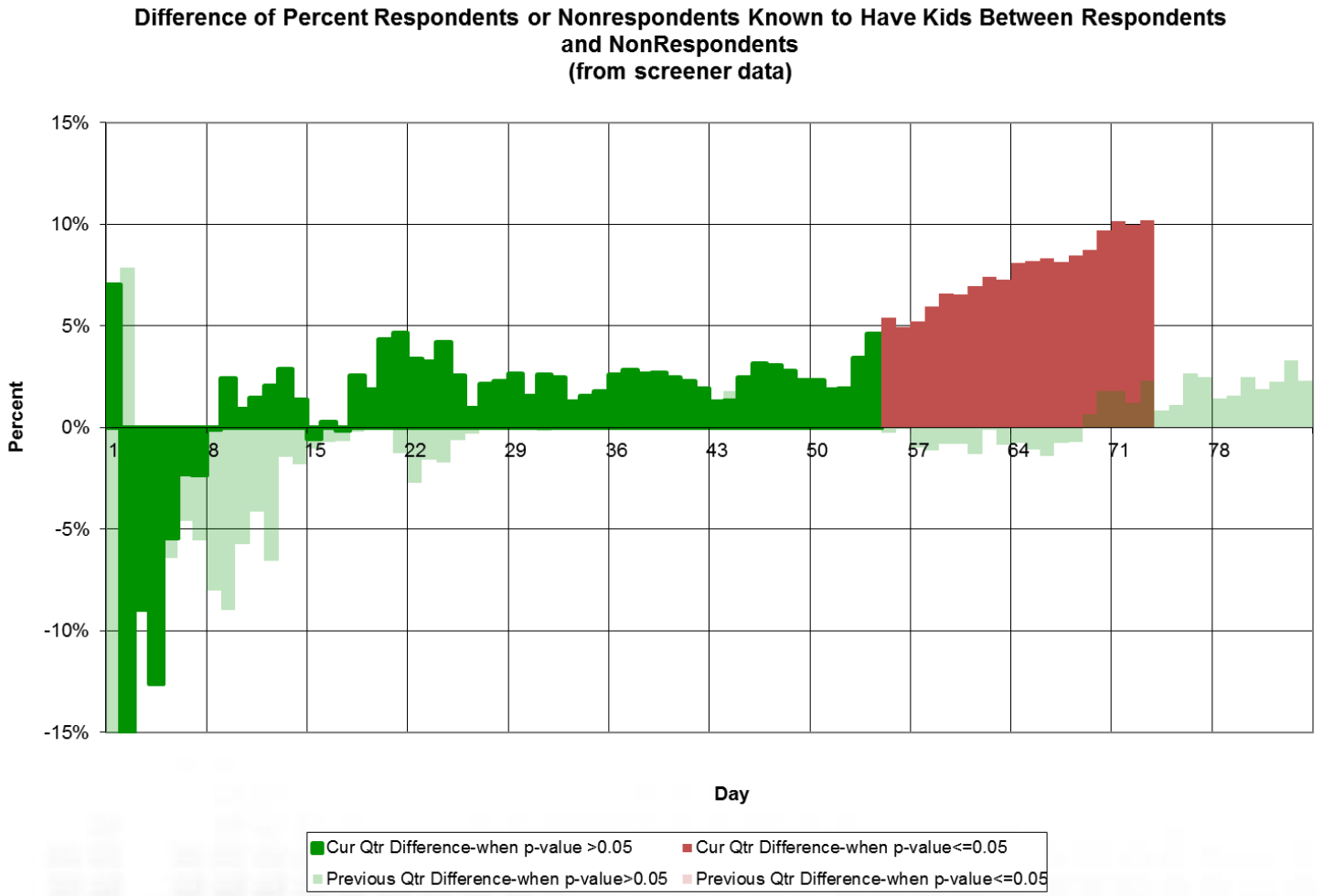
Bar Chart – Multiple Metrics against goal



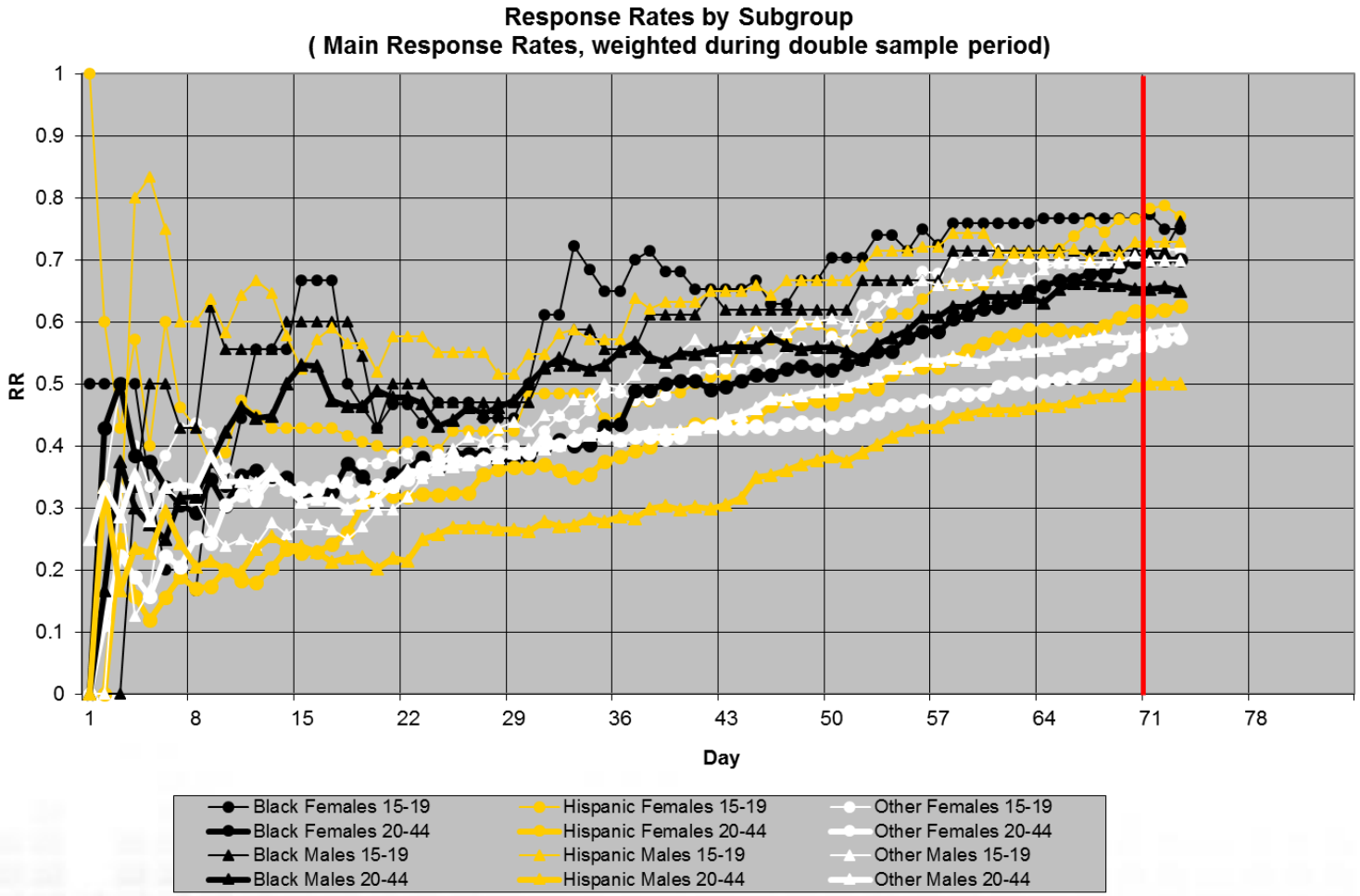
Stacked Bar Chart – Change of Proportion with Time



Charts that simultaneously display magnitude, direction and also the statistical significance of the metric



How to show the comparison to the benchmark when a chart is already busy – Something like drill down features?



Excel Dashboard – Interviewer Level Report

- Interviewer performance profile (NSFG)
- TL tool kit (HRS)

Interviewer Performance Profile

Each row is the metrics for one interviewer

Key Performance Metrics

PAIP Scores

Data Quality Metrics

More in the good direction

More in the bad direction

Iwrname	# PSU Attempted	% of Called to Main PSU	Hours (SMTAC)	% of scrn and main hours	HPI	Scrn Iw	Main Iw	Scrn RR (unweighted)	Main RR (unweighted)	Eligibility Rates	% Kids Discrepancy (R-NR)	% Sexual Active Discrepancy (R-NR)	PAIP - Scrn Interview	PAIP Main Interview	PAIP - Eligibility Rates	PAIP - Scrn Contact Rates	PAIP - Main Contact Rates	Data Quality - Too Fast	Data Quality - Many Error Checks	Data Quality - Many DK/RF
iwer1	1	100%	281	63%	28.1	37	10	69%	67%	54%	-20%	0%	-1%	-9%	-12%	-5%	-8%	-0.1	-1.3	-0.3
iwer2	1	100%	285	47%	8.9	91	32	88%	91%	56%	0%	34%	0%	-3%	2%	3%	-12%	-0.2	0.8	-0.3
iwer3	1	100%	359	62%	6.4	125	56	98%	84%	66%	30%	-12%	9%	-2%	2%	17%	14%	-0.9	-0.3	0.5
iwer4	1	100%	345	66%	15.7	71	22	97%	81%	49%	10%	15%	6%	-1%	2%	-15%	-7%	-0.9	-0.2	-1.1
iwer5	1	100%	478	58%	6.7	167	71	98%	91%	56%	-2%	-4%	-9%	2%	-3%	22%	24%	-0.3	-0.4	-0.2
iwer6	1	100%	346	72%	34.6	74	10	97%	83%	19%	-20%	20%	2%	-2%	-23%	-9%	-32%	1.5	0.7	1.1
iwer7	1	100%	334	70%	10.1	73	33	95%	80%	74%	18%	25%	-9%	2%	10%	-5%	12%	0.1	-0.3	-0.2
iwer8	1	100%	334	68%	6.3	114	53	98%	90%	60%	14%	9%	0%	-3%	12%	-1%	0%	-1.0	-1.3	2.1
iwer9	1	100%	321	61%	40.1	55	8	92%	80%	27%	75%	25%	5%	-4%	-8%	-6%	-1%	-0.2	-0.7	-0.6
iwer10	1	100%	376	59%	13.0	82	29	89%	74%	67%	-18%	-11%	-3%	-6%	14%	1%	2%	-0.1	0.4	-0.6
iwer11	1	100%	339	66%	9.7	101	35	94%	80%	62%	7%	-1%	3%	0%	7%	-2%	-5%	-0.7	-0.5	-0.7
iwer12	1	100%	231	55%	14.4	45	16	92%	84%	53%	-63%	-6%	-5%	-5%	-6%	4%	6%	-1.3	0.2	-0.9
iwer13	1	100%	363	53%	16.5	75	22	91%	81%	61%	-19%	-18%	-5%	-2%	8%	1%	-1%	-0.6	0.0	0.3
iwer14	1	100%	352	65%	11.0	96	32	97%	86%	58%	16%	4%	-2%	-8%	6%	17%	25%	-0.1	0.7	1.3
iwer15	1	100%	364	62%	11.4	113	32	97%	76%	62%	-25%	-11%	10%	6%	8%	-10%	-7%	0.1	-0.1	-0.3
iwer16	1	100%	380	73%	7.3	137	52	94%	88%	47%	-5%	19%	0%	4%	-2%	12%	16%	1.2	-0.8	-0.2
iwer17	1	100%	317	65%	12.2	85	26	93%	87%	64%	-25%	0%	0%	21%	6%	9%	5%	0.8	-0.6	-1.3
iwer18	1	100%	154	67%	7.0	77	22	99%	96%	62%	-45%	82%	0%	6%	10%	20%	19%	-0.2	0.5	-1.2
iwer19	1	100%	358	62%	8.0	91	45	94%	83%	70%	0%	20%	2%	-1%	3%	-7%	0%	-1.3	0.2	-0.6
iwer20	1	100%	291	65%	9.7	96	30	96%	83%	58%	-27%	-20%	-4%	-9%	4%	9%	-3%	-0.1	-0.3	-0.6
iwer21	1	100%	343	59%	20.2	84	17	97%	85%	37%	59%	16%	2%	3%	-9%	7%	-7%	-1.0	-1.0	-0.6
iwer22	1	100%	333	64%	11.5	127	29	99%	94%	32%	2%	0%	6%	8%	-14%	10%	7%	0.5	3.5	-0.9
iwer23	1	100%	337	52%	8.2	136	41	99%	80%	46%	14%	20%	2%	4%	-7%	8%	9%	0.5	1.2	0.8
iwer24	1	100%	338	56%	9.6	92	35	99%	95%	52%	43%	-43%	0%	11%	0%	-1%	-8%	0.4	-0.6	0.7
iwer25	1	100%	312	67%	17.3	53	18	90%	78%	55%	17%	0%	-1%	10%	3%	-9%	-13%	0.3	-0.6	-0.1
iwer26	1	100%	321	59%	11.1	96	29	100%	88%	46%	-16%	-3%	5%	4%	9%	-7%	-29%	-1.0	-0.7	-0.8
iwer27	1	100%	304	60%	16.0	98	19	91%	83%	31%	-42%	-17%	-4%	-7%	-16%	-3%	1%	0.4	0.1	0.0
iwer28	1	100%	331	51%	8.1	76	41	88%	91%	70%	19%	43%	-7%	0%	8%	1%	8%	-0.4	0.1	-1.1
iwer29	1	100%	218	69%	12.8	73	17	97%	100%	41%			4%	-7%	-23%	10%	14%	0.4	1.5	-1.1
iwer30	2	53%	348	54%	29.0	75	12	99%	75%	27%	-2%	3%	5%	9%	-28%	-15%	-31%	1.9	0.0	0.8
iwer31	2	56%	362	49%	22.6	57	16	95%	76%	46%	31%	15%	1%	0%	-4%	-11%	-3%	2.0	-0.1	0.5
iwer32	2	74%	214	65%	5.4	89	40	100%	87%	76%	-7%	-1%	8%	2%	0%	1%	-2%	1.2	-0.1	4.2
iwer33	2	76%	312	63%	9.5	52	33	85%	75%	69%	0%	-12%	-3%	-2%	5%	-9%	-7%	-0.3	-0.9	1.2
iwer34	2	89%	341	54%	9.5	83	36	81%	80%	67%	-22%	-11%	-10%	2%	18%	14%	29%	-1.7	-0.2	0.3
iwer35	2	100%	319	57%	13.9	55	23	77%	88%	49%	-3%	25%	4%	13%	-1%	-11%	11%	-0.1	0.4	1.6
iwer36	3	55%	403	62%	7.8	141	52	98%	91%	67%	-19%	-12%	4%	5%	1%	4%	13%	-0.8	-0.3	-0.3
iwer37	3	79%	380	55%	14.1	70	27	99%	77%	64%	26%	16%	-5%	6%	3%	31%	19%	0.5	0.4	-0.6
iwer38	3	88%	365	49%	13.0	70	28	83%	76%	56%	42%	-10%	2%	4%	-7%	-1%	6%	1.5	0.6	-1.3

Interviewer Performance Profile

- Key Performance Metrics
  - Effort: Hours ; % of screen and main hours
  - HPI
  - Yield
  - Response Rates
  - Eligibility Rates
  - Data Set Balance: % Kids Discrepancy; % Sexual Active Discrepancy, Subgroup RR
  - Resistance Rate
- PAIP Scores – Account for difficulty and or sample characteristics
  - Interview; Eligibility Rate; Contact Rate
- Data Quality Metrics
  - Help identify the interviewers whose data quality indicators are very different from the interviewer average
  - Too Fast ; Many Error Checks; Many DK/RF

PAIP Score

A Propensity-Adjusted Interviewer Performance Indicator

- Interview PAIP (West and Groves, 2013)
  - Evaluate the effectiveness of interviewer that incorporates *difficulty* of the interviewing task at the contact level
  - 3 steps
    - For each active case, available paradata are used to estimate the propensity that the next contact with the case will generate an interview
    - a successful interview on the next contact => 1 - estimated response propensity. a non-successful interview on the next contact => 0 - estimated response propensity
    - for each interviewer, the contact-level scores are averaged over all contacts
  - This performance indicator gives large credit to the interviewer who obtains success on very difficult cases, and only a small penalty given failure with such cases. The indicator gives only small credit to success on very easy cases and larger penalties given failure with easy cases.
  - For example,
    - if estimated response propensity=0.8. success : 1-0.8=0.2. not success:0-0.8=-0.8

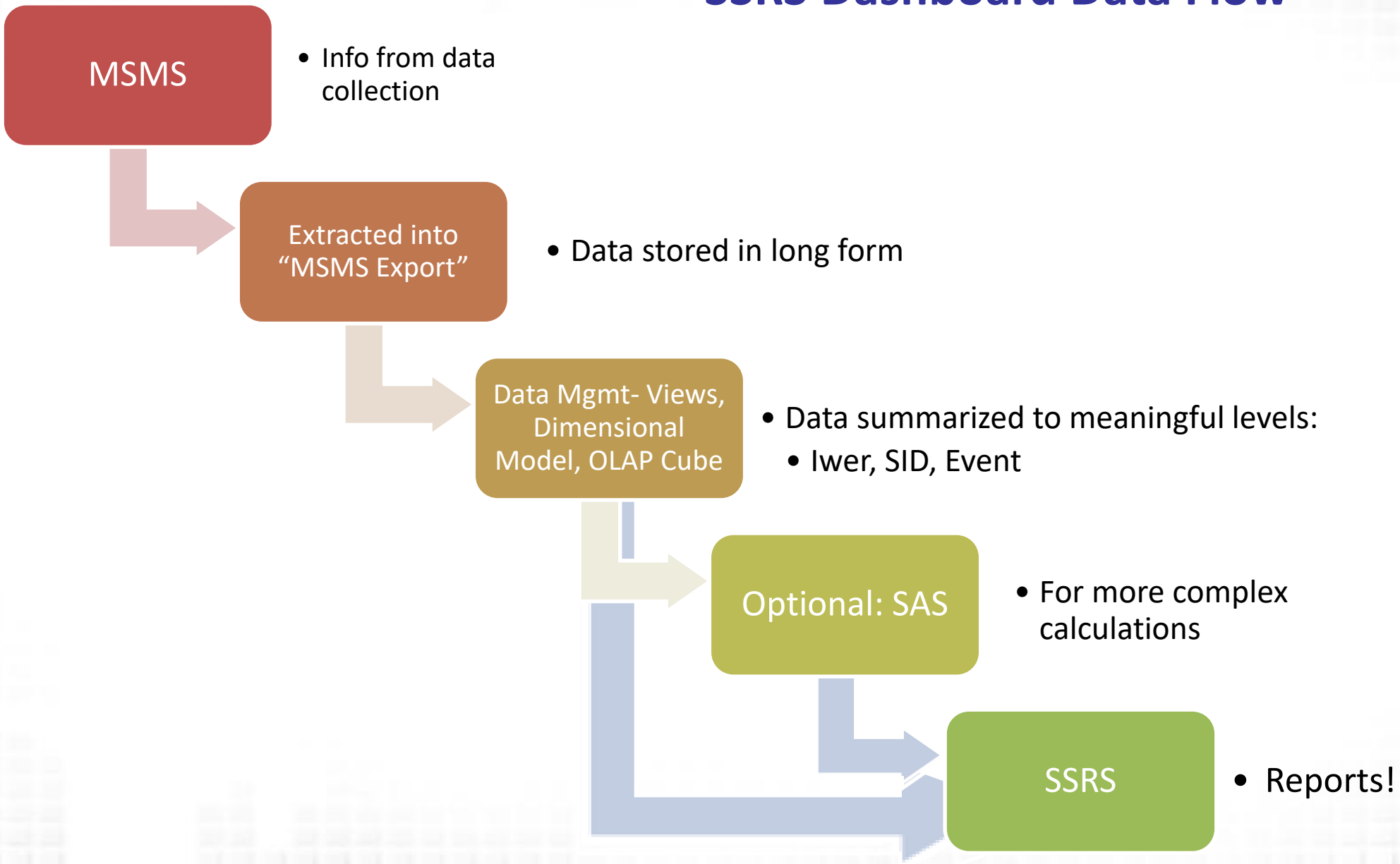
TL Tool Kit

Excel Dashboard – Interviewer Level Report

- Interviewer performance profile (NSFG)
  - Heat map with all metrics in one table
  - Color coded to quickly identify the interviewers that need additional training or follow up
    - Green in good direction and red in bad direction
  - Including PAIP score that account for sample characteristics and other factors that are independent of interviewer performance
  - Part of the dashboard process and scheduled to be updated automatically daily

- TL tool kit (HRS)
  - Pivot table that allow the TL and PC to quickly look at their group
  - Additional filters are also available (Experienced interviewer, SSL etc.)
  - Team average and national average serves as benchmark
  - Both weekly and cumulative metrics are available

SSRS Dashboard Data Flow



SSRS (SQL Server Reporting Services)

- Server based reporting platform that links directly to a database
  - Allows reports to be constantly updated
  - “Subscription” takes a snapshot of a report at a scheduled time
- Report features
  - Subreport action that connects to other reports or to websites
  - Drill down “accordions” that allow top level groups to be broken down further
  - Parameters- allow report reader to filter data selected in report
    - Time, day, sample release, TL, IWER
  - In addition to common chart types
    - Indicators, gauges
    - maps are also available
  - Tool tips
  - Easy exporting to excel, pdf, tiff, word
  - Searchable
  - Template- SRO reports look similar
    - Best practices- report documentation
- Reports published in web based SRO report portal

STARRS LS Dashboard Design Features

- Access through SRO report portal
  - https://srowebadmin.isr.umich.edu/SRORpt/logon.cfm

  - SSL Day Report
    - Drill through “accordion” feature
    - Standard template (with documentation)
  - Safety Plan Report
    - Indicators, gauges
    - Standard template
  - Dashboard with PI focus
    - provide at-a-glance views of key metrics displayed with a variety of formats
    - All report element can be simultaneously filtered to a specific time period
    - Link to other reports that provide more detailed information relevant to the key indicators
    - Link to navigate to other websites

Coming up next

Introductory Statistics – Nov. 14 – Perry 2300 - 12:00 noon

(Heather Schroeder)

This session will provide a very basic overview (refresher) of statistical measures and techniques (avoiding formulas as much as possible). We will provide explanations of means, medians, modes and standard deviations; the meaning of "statistical significance"; how to interpret a confidence interval; difference of means tests; and t-tests.

Overview of Sampling – December 6 – Perry 2300 - 12:00 noon

(Dan Zahs)

This session will provide a basic explanation of probability and the theory behind probability sampling. We will provide examples of the most commonly used sample designs and sample frames, and briefly comment on the development of online panels.

Click here to add "Overview of Sampling" to your calendar w/ Blue Jeans link

The Statistics and Methods Unit will also be presenting sessions on **Weighting and Propensity Models in early 2017.**