

# Understanding the WWC Procedures and Standards

## Webinar Transcript

### November 16, 2017

#### **Slide 1**

Hello, everyone, and thank you for attending today's webinar: *Understanding the WWC Procedures and Standards*. I'll be briefly going through some housekeeping information before we get started.

You can make the slides larger on your screen by clicking the bottom right corner of the slides window and dragging out. If you have accessed the audio for the webinar through the teleconference line, you may experience a slight delay. If possible, we encourage you to listen to the webinar through your computer or device speakers. We encourage you to submit questions throughout the webinar using the Q&A tool on the webinar software on your screen. You can ask a question when it comes to mind; you don't have to wait until the question and answer session.

Because we're recording this, every member of the audience is in "listen only" mode. That improves the sound quality of the recording, but it also means that the only way to ask questions is through the Q&A tool. So, please use that. We've scheduled 90 minutes for this webinar. We will try to answer as many questions as possible. The slide deck and a recording and transcript of the webinar will be available on the WWC website for download.

So, with that, let's get started. I'd like to introduce Chris Weiss, Senior Education Research Scientist, National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Chris, you now have the floor.

Thank you, Brice. Hi, this is Chris Weiss. I'm the team lead for the What Works Clearinghouse. It's my pleasure to welcome you to today's webinar: *Understanding the Updated WWC Procedures and Standards*. The new Version 4.0 *Handbooks* were released October 30th and are updated to keep pace with new advances in methodological research.

Today's presentation will provide an overview and describe the WWC's process for developing the updated *Handbooks*, and explain the changes from the previous *Handbook*. I'll be back later in the webinar, during the question and answer period, and I'll be joined by my colleague, Jon Jacobson. And with that, it's my pleasure to turn this over to Neil Seftor. Neil?

Thanks, Chris. I'd like to thank everyone for joining us for today's webinar on Version 4 of the What Works Clearinghouse's Procedures and Standards. I'm Neil Seftor, a senior economist at Mathematica Policy Research, and I oversee Mathematica's work on the What Works Clearinghouse. My co-presenter today is Elias Walsh, another senior economist at Mathematica, who oversees our WWC work on content and standards.

During this webinar, we're going to be giving you a high-level overview of the changes in the WWC's recently released Version 4 standards and procedures. First, I'll give a brief overview of the WWC and

the Handbooks, including our processes for updating them. Next, I'll turn it over to Elias to discuss some of the standards that have been changed significantly, including studies with cluster designs, missing data, and noncompliance. Then, I'll discuss some standards that have been revised or updated, including baseline equivalence, regression discontinuity designs, and statistical significance. I'll finish with some procedural updates, along with highlighting some resources you can use to find more information. Finally, we will turn the webinar over to Chris and Jon Jacobson, the WWC project officers at the Institute of Education Sciences, who will answer any questions you may have. As a reminder, you can submit your questions at any time through the Q&A tool.

### **Slide 2**

First, a little background and context for talking about the WWC. Over the past 15 years, there has been an increasing push for education decision makers to make evidence-based choices, from *No Child Left Behind* through the *Every Student Succeeds Act*. However, this is complicated by the fact that identifying good research is hard. For decision makers without technical expertise, sifting through evidence and coming to a conclusion can be daunting and time-consuming. Searching on any particular educational topic may return hundreds of studies. And even if decision makers did have the time to find and read all of the relevant research, it can be difficult to identify the credible studies. Beyond that, it might be hard to figure out what to make of the findings, particularly when multiple studies offer potentially conflicting results. This is where systematic reviews can help, by objectively and transparently identifying, appraising, selecting, and synthesizing high-quality research evidence relevant to a question of interest.

The WWC was established in 2002 to be a central and trusted source of scientific evidence for what works in education. The Clearinghouse was one of the first investments of the Institute of Education Sciences, which is an independent, non-partisan entity within the U.S. Department of Education. The WWC acts an intermediary between researchers and decision makers. For researchers, the WWC establishes standards for high-quality evidence, making them known to the research community, and reviews the studies produced by them using WWC standards. The hope is that this is a virtuous cycle, in which the rigorous standards lead to higher-quality studies over time. For decision makers, the WWC summarizes and disseminates the evidence in accessible products, while gathering input from decision makers about the problems they are facing and what they need to know.

It's also important to clarify what the WWC does not do. It does not directly test or study interventions. It does not commission new research on interventions. And it does not recommend or approve specific interventions.

The WWC encourages decision makers to use the information to make their own choices. This whole structure is designed to allow rigorous evidence to inform decision making, leading to improved student outcomes.

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Today, we're going to talk about two documents that guide our work. The five steps listed below comprise our systematic review process. The *WWC Procedures Handbook* contains information on all of the steps we use in the systematic review process, including finding studies, screening them for eligibility, and reporting on findings. The *WWC Standards Handbook* contains detailed information on the standards we use to assess study quality. These two documents, which we've called Version 4, replace the single Version 3 document. They are now split to allow for ease of future separate updating of procedures and standards separately as necessary. Released in October, the Version 4 *Handbooks* reflect the most up to date procedures and standards used by the WWC.

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So, why do the procedures and standards need to be updated? There are two key reasons. First, existing research methods evolve, and new research methods are used. In order to keep pace with the field, we revise and develop standards to deal with these changes that appear in the research we review. Second, we sometimes find that our procedures or standards are unclear or don't deal with specific situations. We find these in the course of reviewing studies and through questions and comments from education decision makers and researchers. In the short run, we provide additional guidance to reviewers and answers to people who send us questions. But then, we incorporate all of that information in the next version of the *Handbook*.

Let me give you a couple of examples. The Version 1 standards evaluated attrition using fixed cutoffs, while the Version 2 *Handbook* presented new standards for attrition that were based on a theoretical model for attrition bias and empirically based assumptions. So, though looking at attrition has always been part of evaluating the quality of a randomized controlled trial, the specific standards changed to more realistically match the research. The Version 2.1 standards added pilot standards for the review of single-case design studies. The WWC did not initially have standards for reviewing single-case design studies, and could not determine their quality. But as the WWC expanded into special education topics, we needed to be able to evaluate these studies, so new standards were developed. Besides keeping up with methodology and increasing clarity, the *Handbooks* also provide transparency. Everything the WWC does, including the rules for all the decisions that are made, are documented in these *Handbooks*, so that individuals can verify that we are following our own procedures and standards.

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The WWC uses an extensive process to update and develop standards. For many issues, we put together a panel of experts to provide insight into the latest methods and practices. Based on those discussions, we draft standards related to the issue and review them with the panel to make sure they are consistent with best practices. The draft standards are then reviewed by the WWC's Statistical, Technical, and Analysis Team. This group of methodologists is more familiar with the operations of the WWC and the standards, and help determine how the new standards will work within the existing review framework. After this review and any revisions, the standards are reviewed by IES methodologists and sent to external peer reviewers. Again, discussions may be had and changes made to address issues raised by reviewers. The draft standards are then posted to the website for public comments. For example, the updated standards for cluster-level assignment and regression discontinuity designs were posted in December 2016. After all of the comments have been addressed and revisions made, IES gives its final approval. The *Handbooks* are revised to incorporate all of the changes and additions, and then posted to the WWC's website, along with a companion document that highlights the changes.

With that, I'll turn it over to Elias to talk about some of the more major standards changes in version.

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Thank you, Neil. The first change for the Version 4.0 *Handbooks* we will discuss today is the restructured standards for studies with cluster-level assignment. Cluster studies are those that assign clusters, or groups, to conditions instead of individuals. Examples of clusters include schools, teachers, and classrooms. There are many reasons a researcher might assign clusters to conditions rather than individuals, such as students. For example, the intervention may be implemented at the cluster level,

such as a whole-school reform model, or a classroom curriculum. In such cases, all students within a cluster receive the intervention, so it is not possible to form a comparison group from within the cluster.

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To be considered a cluster-level assignment study, a study must meet two conditions. First, individuals must be assigned to the intervention or comparison condition as groups. For example, a cluster study could assign schools or classrooms to conditions because both represent groups of students. Second, the data the study analyzes must be based on individuals within clusters. To take an example, imagine that a study assigned five schools to implement a new curriculum and five others to continue using the old curriculum. The study examines the effect of the curriculum on the achievement of students in the schools. This is a cluster-level assignment study because clusters, or schools, were assigned to conditions, and the study analyzes data based on individuals, or students.

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The updated standards for cluster-level assignment studies are designed to assess whether some of an intervention's effects may have been caused by compositional changes within clusters. In many cluster RCTs, the sample of individuals within clusters changes over time.

Consider a study that randomly assigned schools to conditions early in the fall of a school year, and measured outcomes for students at the end of the school year. The students present in the schools in the fall may differ from those present at the end of the school year, because some may leave the school and others may join the school. These compositional changes may cause the groups to become dissimilar, which can threaten the study's ability to measure the true effect of the intervention. Compositional changes pose a particular risk if the individuals who left or joined the cluster did so because of the intervention, such as when students join a classroom because the intervention is attractive. Under the Version 4.0 standards, studies that limit risk from compositional changes can satisfy WWC standards for effects on individuals and potentially receive the highest WWC rating. Studies that do not limit this risk might still satisfy WWC standards for effects on clusters, which includes the possibility that the intervention led to compositional changes within clusters.

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Now, let's look more closely at the new cluster standards. Compared to how cluster-level assignment studies were reviewed under the Version 3.0 standards, there are three substantive changes in how they will be reviewed under the Version 4.0 standards. First, the language used to describe inferences will no longer have a bearing on the review process. Under Version 3.0, whether study authors describe their findings as effects on clusters or effects on individuals could affect a study's rating. Under Version 4.0, studies that do not satisfy WWC standards for effects on individuals will always be reviewed for effects on clusters, regardless of how study authors describe their findings.

Second, cluster randomized controlled trials with individuals who entered clusters after random assignment may now be eligible for the highest WWC rating of *Meets WWC Group Design Standards Without Reservations* if those joiners were unlikely to have joined due to the intervention. Review protocols, which guide all WWC reviews and are posted on the WWC website, will be updated for Version 4.0 and will specify the situations where joiners are not likely to pose a risk when measuring the effect of the intervention. For example, students may be unlikely to enroll in a school because a certain math curriculum was being offered there. Under Version 3.0, any joiners in these schools would have been considered a risk even though the joining was unlikely to be related to the intervention, but under Version 4.0, the joiners may not affect the study rating.

Third, when compositional changes are likely to pose a risk when measuring the effect of the intervention, the study is not eligible for the highest rating. These studies may still be eligible to be rated *Meets WWC Standards With Reservations* if the individuals who contribute data to the analysis are representative of the population in the clusters. In a cluster randomized control trial that assigned schools to conditions, this means that enough of the students present in the schools at the time that outcomes were measured must contribute data to the analysis so that the study can credibly measure the effect of the intervention on the clusters, including its effects on where students attend school.

The *WWC Standards Handbook* provides details on these standards and requirements for cluster-level assignment studies.

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Eligible cluster-level assignment studies receive one of the three ratings that the WWC assigns to all group design studies. A cluster-level assignment study can be rated *Meets WWC Group Design Standards Without Reservations* when it has only small compositional changes, including no joiners who the review protocol identifies as posing a risk when measuring the effect of the intervention. The study can be rated *Meets WWC Group Design Standards With Reservations* if it satisfies WWC standards for evidence of effects on individuals, which requires that risk from compositional changes be limited. It is also possible for a study that satisfies WWC standards for evidence of effects on clusters to receive this rating, which may include an effect of the intervention on the composition of individuals within clusters. The rating *Does Not Meet WWC Group Design Standards* is assigned to studies that do not satisfy WWC standards for effects on individuals or on clusters.

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Now, I'll turn to the restructured standards for studies with missing data. Missing data is present in many studies. For example, a study may have incomplete data on a student who was absent during a test, or left a study school. Data may be missing for baseline measures assessed before an intervention was introduced, or for the outcome measures used to measure the effectiveness of the intervention.

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When data are missing, study authors may exclude the subject from their analysis, or use approaches to keep the subject in the analysis such as when an author replaces the missing data with imputed values. Under the Version 3.0 standards, imputed data for outcomes or for key baseline measures were only allowed in low-attrition randomized controlled trials. If the imputed data were analyzed in a quasi-experimental design or high-attrition randomized controlled trial, the study would be rated *Does Not Meet WWC Group Design Standards*. This was because missing and imputed data pose a risk when measuring the effectiveness of an intervention. In general, this risk is higher when a study has more missing data or when the subjects with missing data appear less similar to those with observed data. Under Version 4.0, a quasi-experimental design or high-attrition randomized controlled trial that analyzes imputed data can be eligible to meet standards, but only if the WWC can determine that the risk from the missing data is low.

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The WWC made four substantive changes to the standards for reviewing missing data. First, the WWC revised the list of acceptable methods to address missing data. These acceptable approaches are described in detail, along with the rest of the missing data standards, in the *Version 4.0 Standards Handbook*.

Second, a high-attrition randomized controlled trial that analyzes the full sample subject to random assignment by imputing outcome data does not need to satisfy the baseline equivalence requirement. To understand why, consider a randomized controlled trial study that followed students for several years. By the final year of the study, the study authors were able to collect outcome data from only a fraction of the original sample. If they analyze only the observed outcome data, there is a concern that the remaining intervention students may have different baseline characteristics from the remaining comparison group students. The WWC would therefore require baseline equivalence to be established. However, if the authors instead analyzed imputed values for all of the students with missing outcome data, the WWC no longer needs to be concerned that the intervention and comparison groups differ because they include all of the students who were randomly assigned to condition. Although the WWC would not assess baseline equivalence for such an analysis, the WWC would assess the risks to impacts estimates from analyzing the imputed outcome data.

This is the third change to the standards. In quasi-experimental designs and high-attrition randomized controlled trials, the WWC will assess whether analyzing imputed outcome data could pose a risk when measuring the effect of the intervention. In brief, the WWC does this by examining whether the subjects with imputed outcome data differ from those with observed outcome data on key baseline measures observed for all subjects.

Finally, in quasi-experimental designs and high-attrition randomized controlled trials, it is now possible to satisfy the WWC's baseline equivalence requirement when data are missing or imputed for a baseline measure required for baseline equivalence. The WWC will assess baseline equivalence in a study that is missing baseline data for subjects included in the analysis in part by examining whether outcomes for subjects with missing baseline data differ from outcomes for those with observed baseline data.

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The WWC has also introduced new standards for studies with noncompliance.

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Noncompliance occurs when not all of those assigned to the intervention condition actually receive the intervention. For example, consider a study in which students are selected to attend a charter school based on a lottery. Not all of the students who are selected to attend the charter school ultimately do so, and may instead choose to attend their neighborhood school. These students are non-compliers because they were assigned to the intervention condition via the lottery but actually received the comparison condition. Those assigned to the comparison condition can also be non-compliers if they ultimately receive the intervention. If noncompliance isn't accounted for, it can sometimes lead to a study finding smaller impacts. For example, the authors may examine the effect of the charter school by comparing outcomes for all those assigned to the charter school to those assigned to the comparison group, sometimes called an intent-to-treat analysis. If the charter school is effective, those gains will only be measured for the portion of the students in the sample who actually attended, leading to a smaller finding than if all students assigned to attend the charter school had done so.

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Under Version 4.0 standards, analyses that address noncompliance in two specific ways can be rated *Meets WWC Design Standards Without Reservations*. First, complier-average causal effect estimates, or CACE estimates, use a statistical approach called two-stage least squares to assess the impact of an intervention among compliers in randomized controlled trials. Second, fuzzy regression discontinuity designs use a similar approach in studies where the assignment cutoff imperfectly predicts intervention

participation. CACE estimates and fuzzy regression discontinuity designs must satisfy some additional requirements beyond what is required for another randomized controlled trial or regression discontinuity design. These requirements are described in the Version 4.0 *Standards Handbook*.

And now, I will turn the presentation back over to Neil Seftor, who will talk about some additional changes to the WWC procedures and standards.

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Thanks, Elias. In addition to the major changes described by Elias, there were a few more modest refinements made to some standards.

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The most significant of these is an expansion of methods that can be used to satisfy the baseline equivalence requirement. You may recall that for randomized controlled trials with high attrition and for all quasi-experimental designs, a demonstration of equivalence on some measures at baseline is required to meet standards. To establish equivalence, the WWC examines the standardized mean difference between the intervention and comparison groups on measures specified in the protocol. For example, a study reviewed by the Primary Math team would need to demonstrate that the two groups were similar on a math achievement test at baseline. For WWC reviews, if that standardized mean difference was less than 0.05, the study met the requirement. If it was larger than 0.25, the study did not meet standards. For differences between 0.05 and 0.25, the WWC requires a statistical adjustment. Under Version 3 standards, this had to be a regression adjustment, including the measure in the analysis at the individual level, such as in an ANCOVA.

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Under Version 4 standards, other analytical approaches may satisfy the statistical adjustment requirement, in some specific situations. This expansion is due to a recognition that some alternative methods perform as well as the existing approach. Specifically, when the outcome and baseline measures are closely related and measured using the same units, there are three additional methods that can be used to satisfy this requirement. One is a difference-in-differences adjustment, in which the difference in baseline means is subtracted from the difference in outcome means. A second is an analysis of simple gain scores, which examines the difference between the outcome and the baseline measure for each individual. The third is a fixed effects analysis of individuals, which includes both baseline and outcome measures for each individual, along with an indicator for each individual in the analysis.

As I said earlier, these are acceptable in limited situations, defined by two criteria: First, the baseline and outcome measure must be measured using the same units. This would be met if the researchers administered the same test and used the same scoring procedures for the baseline measure and the outcome. This would not be met if the researchers administered different tests for the baseline and outcome measures, or if they used the same test, but used a different scoring procedure. Second, the baseline and outcome measure must have a correlation of 0.6 or higher. If both conditions are met, a difference-in-differences adjustment, analysis of simple gain scores, or fixed effect analysis of individuals can satisfy the statistical adjustment requirement to demonstrate equivalence, when the standardized mean difference of the baseline measure is between 0.05 and 0.25.

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Another update was made to the regression discontinuity standards. The use of these designs in education research is still relatively new, so the best practices of the field have continued to evolve. More recent research has concluded that an analytic method called local bandwidth impact estimation can better reflect the relationship between the forcing variable and the outcome, compared to other methods. Therefore, under Version 4 standards, only regression discontinuity designs that use this local bandwidth impact estimation can receive the highest WWC rating. Additionally, as we have seen regression discontinuity designs used in a wider range of contexts, we have extended the standards to be able to assess studies with multiple sites or using multiple assignment rules.

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Under Version 4, we've also updated some formulas for calculating the statistical significance of findings. For continuous outcomes, we've revised the adjustment that we use to adjust for small sample sizes. For dichotomous outcomes, we've replaced the effect size formula based on updated research in the area. The WWC will continue to use study-reported statistical significance when possible, but will use these updated formulas when significance needs to be computed by the WWC.

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Finally, the Version 4 *Handbooks* contain guidance on a number of issues that has been developed over the past 3 years, along with clarification and examples throughout the text.

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These include issues such as propensity score analyses, multi-period analyses, confounding factors, how a study is defined, and multiple comparison corrections.

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Today, we've provided a very high-level overview of some of the more significant changes in the WWC's procedures and standards in Version 4. There are both more changes and more details on these changes in the *Handbooks* themselves.

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As I noted earlier, the updating and development of standards is an extensive process, involving a variety of experts at multiple stages. These Version 4 *Handbooks* could not have been completed without the insight of a number of people, including the WWC's Statistical, Technical, and Analysis Team, and panels of experts who consulted on cluster assignment studies, missing data, and regression discontinuity designs. We appreciate their time and guidance.

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For more detail on all of these changes and more, I encourage you to check out the *Handbooks* for yourself. You can find them by going to Procedures & Standards Handbooks, at the top of the Handbooks & Other Resources menu on the WWC website. On that page, you'll find the *Procedures Handbook*, *Standards Handbook*, and a summary of changes made for Version 4. You can also access prior versions of the *Handbooks* through the menu on the left.

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We have a number of other resources related to procedures and standards that you may be interested in. On the *Handbooks* web page, you can find webinars related to standards and other materials, such as standards briefs and our review protocols. Elsewhere on the site, you can find a set of online training modules that cover the WWC procedures and standards. These will be updated soon to reflect the



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Version 4 changes, and new modules will be posted over the next few months. Finally, for those of you certified on Version 3 standards, you'll be informed shortly on how to be recertified for Version 4.

### **Slide 28**

As always, we encourage you to keep in touch with us. Here are some web links to help you stay connected to the WWC. You can search for and download WWC intervention reports through Find What Works. You can join our email-based newflash list and follow us on Facebook or Twitter to stay informed about future intervention report releases, webinar opportunities, and other events. You can also send us an email through our Help Desk. We look forward to hearing from you!

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And with that, I will turn it over to Chris Weiss from the Institute of Education Sciences, who will moderate the question-and-answer portion of the webinar. Chris?

Thank you Neil. It's my pleasure to be back with you. I'm joined by my colleague Jon Jacobson. Neil mentioned a couple of things that we are going to talk about, and we can add some more detail to this. A number of questions are coming in from you, and we will do our best to address many of them.

I forgot to note, and would like to do so now, that we will take all the questions and provide written responses that we will then post on the Clearinghouse website, probably under the Procedures & Standards Handbooks section that Neil showed a few slides ago. Some of the questions that we received from you guys are terrific but very technical, and rather than taking time during the webinar, it would be easier to provide fuller responses via writing.

The first question had to do with recertification. For those of you who are certified in 3.0 standards, the question is about when will be the opportunities and the process for recertification, and it's a great question. There will be a webinar that will be held within the next month or so. I should say, recertification applies to those of you on the call and webinar who are certified in Version 3.0 of the standards. For you, there will be the opportunity to participate in a webinar, or if you're unable to make it at the time it's scheduled, to view the archived webinar on the website and then take a certification test that will allow you to be certified under the new Version 4.0 standards and procedures. We've not firmed up the date for that yet, but it should be at some point in the next month or so. In addition to that, we'll schedule what we're loosely referring to as office hours so that you have the opportunity to ask some specific questions. This is virtual office hours, so you'll have the opportunity to have some specific questions that you might have addressed, and we can clarify anything that is unclear from the materials that are presented.

Jon, will you take the next of these, please?

Sure, thank you Chris. We received a question about how to distinguish a matter that is a matter of standards from a matter of procedures. And so, the separation of the *Handbooks* into two components allows you to find the procedures in the *Procedures Handbook* and the standards in the *Standards Handbook*. The *Procedures Handbook* describes how the WWC identifies eligible studies and reports on findings from studies that meet WWC standards, while the *Standards Handbook* describes how the WWC reviews and rates studies that are based on eligible designs.

Thank you Jon. There are a couple of other questions that have come in about additional training, and I'd like to address those at this moment.

First of all, the question we received has to do with what about training opportunities for those who were certified under Version 2.1 or earlier. So, you might be under 2.1, 2.0, 1.0. For those, we'll have to do a fuller training, so if you're certified under 2.1, enough has changed from those standards to the current 4.0 standards and procedures that it will require additional certification – excuse me – you'd have to go through the training process. We are currently in the process via the Clearinghouse of creating a fully online version of the training for standards and procedures for Version 4.0. We anticipate having that out within the next couple of months. One thing that has been perhaps challenging for some people is to find a time when they can participate in a scheduled training. With the new online version, this shouldn't be a problem. You'll be able to take the training at any point that is convenient to you. But we'll have more details about that to share in the very near future.

There was a second question related to training about regression discontinuity design standards.

Yes, we'll be planning one of those, and it will be at least a few months away at this point, but what we're describing today covers group design standards. There's a separate training for regression discontinuity design standards that will be held at some point in the not too distant future.

Jon, can I pass it to you for our next question please?

Sure, we received a question asking why the particular topics were included in this update of the *Handbooks*.

And what's important to understand is that the WWC consulted not only with its Statistical, Technical, and Analysis Team on the updating of the standards and procedures, but also from other experts in research methodology with external peer reviewers, of drafts of the new *Handbook*, and with members of the public. And the updating of the *Standards and Procedures Handbook* is something that occurs over time and is something where we are always open to comments and suggestions that can be submitted through the WWC website.

Thank you. Yes, we encourage you to communicate with us through the Help Desk and send us comments and ideas and thoughts about this.

I wanted to clarify as well that, when somebody asked when can we become trained in certified practices, this is the process I described for what will be the online training opportunities. They should be available very early in 2018. So, we'll be in touch and communicate about that.

Jon, can you repeat the question about the difference between standards and procedures?

Certainly. The *Standards Handbook* focuses on the WWC reviews an individual study to assess its internal validity, and describes the ratings that the WWC gives to standards of different designs and what criteria are used in the review of an individual study. The *Procedures Handbook* describes how the WWC identifies eligible studies for review and how the WWC characterizes the findings from studies that meet WWC standards.

Thank you. Yes, and Neil mentioned in an earlier part of the presentation that separating the standards and procedures into separate handbooks, but what had been a single handbook up until this point.

We received a question about single-case design standards, and there, too, this is a different set of standards and a different set of training materials and training opportunities that govern and are available for the single-case design standards that we have.

We have undertaken some work to update the single-case design standards and procedures. That work will continue going forward. We have released in the past year the first intervention report that was based solely on single-case design studies, and there will be more of that work that continues going forward. As far as the specific training opportunities go, there will be, as with regression discontinuity designs, it's a separate process and separate materials. We don't have any immediately scheduled, but we anticipate one to be held in the not-too-distant future.

We received a question as well related to regression discontinuity designs, and I'm going to make this a website question, or a chance to talk a little bit about the Clearinghouse's website. The question is about finding examples of regression discontinuity design studies that have been reviewed by the WWC. And it's a great question.

There are some – there's not a great number of them, and that's largely due to, I think, more the flow. There are some studies out there, but not a great number of them. But if you go to the What Works Clearinghouse website, and in the find Evidence tab, you can find a link to the Reviews of Individual Studies page. That page has a set of pulldown menus that allow you to specify some characteristics of the study that you're searching for including the study design type. So, you can pull down – it's a pull-down menu that is a part of the home page there on the Review of Individual Studies database page. Search only for studies that use a regression discontinuity design, and then you'll be able to find the full set of studies that the Clearinghouse has reviewed using the RDD standards.

We received a question about the updating of study review protocols, and also the updating of outcome domains.

If you go on the WWC website now, you'll see that the review protocols that are there are for use with Version 3.0 standards. We expect the updating of review protocols to correspond with Version 4.0 standards to be occurring in the month ahead. And those review protocols will also specify the relevant outcome domains for those reviews in those topic areas.

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Excellent. So, I believe all the other remaining questions that we have are ones that are more technical in nature. As I said earlier, we will take all the questions that were submitted as part of the webinar and provide written responses to them that will be posted on the Clearinghouse website at some point in the very near future. Again, to reiterate what we said earlier, a copy of the recording of this webinar will be made available as well.

And, let me add, finally, a plug for something Neil mentioned in his portion of the presentation, which is, we encourage you to please do sign up for our newsflashes, check the Twitter page, check the Facebook homepage. We try to put out a lot of content and announcements for the things that we're doing, including webinars like this.

We want to thank you for your attention and participation today on behalf of the What Works Clearinghouse and for Neil and Elias – thank you guys very much for your content in the presentation. With that, I'll turn it back over to Brice.

Thank you. This concludes the webcast for today. The on-demand recording will be available approximately 1 day after the webcast, and can be accessed using the same audience link that was sent to you earlier. You can submit any feedback to the team through the "Contact Us" form on our website – [whatworks.ed.gov](http://whatworks.ed.gov). Thank you.