



NORTHERN TERRITORY PROFESSIONALS

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This is the eighth edition of the NTPS Professionals Newsletter. We hope to receive contributions from members working within the NTPS in the future, this edition also contains articles from other Websites. To contribute articles or letters to this Newsletter, please see below.

United States Department of Agriculture

Report on the National Stakeholders Conference on Honey Bee Health

National Honey Bee Health Stakeholder Conference Steering Committee

**Sheraton Suites Old Town Alexandria Hotel
Alexandria, Virginia**

Executive Summary

After news broke in November 2006 about Colony Collapse Disorder (CCD), a potentially new phenomenon described by sudden and widespread disappearances of adult honey bees from beehives in the U.S., the CCD Steering Committee was formed with the charge to help coordinate a federal response to address this problem. The CCD Steering Committee consists of scientists from the Department of Agriculture's (USDA) Agricultural Research Service (ARS), National Institute of Food and Agriculture (NIFA), Animal Plant Health Inspection Service (APHIS), Natural Resources Conservation Service (NRCS), Office of Pest Management Policy (OPMP), the National Agricultural Statistics Service (NASS), and also includes scientists from the Environmental Protection Agency (EPA). At that time, the Committee requested input and recommendations from a broad range of experts in apiculture about how to approach the problem. Out of this, the steering committee

developed the CCD Action Plan (www.ars.usda.gov/is/br/ccd/ccd_actionplan.pdf), which outlined the main priorities for research and outreach to be conducted to characterize CCD and to develop measures to mitigate the problem. Since formation of the CCD Steering Committee early in 2007, the USDA, EPA and public and private partners have invested considerable resources to better address CCD and other major factors adversely affecting bee health.

Despite a remarkably intensive level of research effort towards understanding causes of managed honeybee colony losses in the United States, overall losses continue to be high and pose a serious threat to meeting the pollination service demands for several commercial crops. Best Management Practice (BMP) guides have been developed for multiple stakeholders, but there are numerous obstacles to widespread adoption of these practices. In addition, the needs of growers and other stakeholders must be taken into consideration before many practices can be implemented.

To address these needs, several individuals from the CCD Steering Committee, along with Pennsylvania State University, organized and convened a conference on October 15-17, 2012, in Alexandria, Virginia that brought together stakeholders with expertise in honey bee health. Approximately 175 individuals participated, including beekeepers, scientists from industry/academia/government, representatives of conservation groups, beekeeping supply manufacturers, commodity groups, pesticide manufacturers, and government representatives from the U.S., Canada, and Europe.

A primary goal of the conference was for the CCD Steering Committee to receive input from stakeholders as they consider future actions to promote health and mitigate risks to managed honey bees in the United States. The meeting had three objectives:

1. Synthesize the current state of knowledge regarding CCD, bee pests, pathogens, and nutrition, potential pesticide effects on bees, and bee biology, genetics and breeding;
- 2) Facilitate the development and implementation of BMPs that stakeholders can realistically incorporate; and
- 3) Identify priority topics for research, education and outreach

to be considered by the CCD Steering Committee for an updated Action Plan.

2. Dr. May Berenbaum gave the keynote address and provided an overview of the historical and current state of pollinators in the United States, from the invention of the first movable hive frame in 1852 and the first printed reference to non-target impacts of agricultural pesticides on bees in 1891, through the first U.S. detection of the parasitic *Varroa* mite in 1987 and the more recent colony declines over the past decade. Leaders in apicultural research gave comprehensive presentations of research progress on CCD, bee pests and pathogens, nutrition, pesticides, bee biology, breeding and genetics.

Highlights of Research Overviews: *As noted earlier, the views expressed in this report are those of the presenters and do not necessarily represent the policies or positions of the U.S. Department of Agriculture, the Environmental Protection Agency, or the United States Government.*

Consensus is building that a complex set of stressors and pathogens is associated with CCD, and researchers are increasingly using multi-factorial approaches to studying causes of colony losses.

- The parasitic mite *Varroa destructor* remains the single most detrimental pest of honey bees, and is closely associated with overwintering colony declines.
 - Multiple virus species have been associated with CCD.
- ☐ *Varroa* is known to cause amplified levels of viruses.
- The bacterial disease European foulbrood is being detected more often in the U.S. and may be linked to colony loss.
 - Nutrition has a major impact on individual bee and colony longevity.
 - Research indicates that gut microbes associated with honey bees play key roles in enhancement of nutrition, detoxification of chemicals, and protection against diseases.
 - Acute and sublethal effects of pesticides on honey bees have been increasingly documented, and are a primary concern. Further tier 2 (semi-field conditions) and tier 3 (field conditions) research is required to establish the risks associated with pesticide exposure to U.S. honey bee declines in general.
 - The most pressing pesticide research questions lie in determining the actual field-relevant pesticide exposure bees receive and the effects of pervasive exposure to multiple pesticides on bee health and productivity of whole honey bee colonies.

- Long-term cryopreservation of honey bee semen has been successfully developed and provides the means for long-term preservation of “top-tier” domestic honey bee germplasm for breeding. Genetic variation improves bee thermoregulation, disease resistance and worker productivity.

- Genomic insights from sequencing the honey bee genome are now widely used to understand and address major questions of breeding, parasite interactions, novel controls (e.g., RNAi), and management to make bees less stressed and more productive.

To facilitate discussion of BMPs and development of priorities, stakeholders were formed into work groups centered on the four main issues affecting bee health: 1) nutrition, 2) pesticides, 3) parasites/pathogens and 4) genetics/ biology/ breeding. The most common themes expressed in several breakout groups were:

- Federal and state partners should consider actions affecting land management to maximize available nutritional forage to promote and enhance good bee health and to protect bees by mitigating their movement into pesticide-treated crop acreage.
- Undernourished or malnourished bees appear to be more susceptible to pathogens, parasites, and other stressors, including toxins. Research is needed on forage, pollen, insect metabolic pathways, artificial and natural food sources, and food processing and storage in the hive.
- More outreach programs targeting farmers on managing potential exposure of honey bees to pesticides is needed. Efforts would benefit from involvement of beekeepers, crop consultants, pesticide manufacturers and applicators, and State lead agencies and extension agents.
- BMPs associated with bees and pesticide use, exist, but are not widely or systematically implemented by members of the crop producing industry. A central theme of the pesticides session was the need for informed and coordinated communication/education/extension of growers and beekeepers and the need for effective collaboration between stakeholders.
- Beekeepers accentuated the need for accurate and timely beekill incident reporting, monitoring, and enforcement.
- Pathogens and arthropod pests have major negative impacts on colonies. Management of *Varroa* and viruses was recognized as a special concern.
- Breeding emphasis is on traits, including hygienic behavior, that confer improved resistance to *Varroa* mites and diseases, such as American Foulbrood.

Although a post meeting survey was not conducted, meeting participants indicated that the conference gave them the opportunity to voice their concerns, to hear the concerns of others, and to offer their perspectives to Federal officials on future directions the government might take to ensure the future of America's pollinators. The CCD Steering Committee plans to revise the CCD Action Plan, a document that will synthesize this input. The Action Plan will outline major priorities to be addressed in the next 5-10 years. This plan will serve as a reference document for policy makers, legislators and the public and to help coordinate the federal strategy in response to honey bee losses. Finally, given the depth of issues effecting pollinator health, consideration should be given to renaming this committee to reflect the broader range of factors discussed in this report.

This report was published by the US Department of Agriculture. The full report can be located at: <http://www.usda.gov/documents/ReportHoneyBeeHealth.pdf>

Report to Congress on the Potential Environmental Effects of Marine and Hydrokinetic Energy Technologies

Executive Summary

Section 633(b) of the Energy Independence and Security Act of 2007 (EISA) called for a report to be provided to Congress that would address (1) the potential environmental impacts of marine and hydrokinetic energy technologies, (2) options to prevent adverse environmental impacts, (3) the potential role of monitoring and adaptive management, and (4) the necessary components of an adaptive management program. As few marine and hydrokinetic devices have been deployed, there have been correspondingly few opportunities to assess their direct impacts. Based on the available information, however, as well as the observed impacts of other activities that may share some characteristics with the deployment and operation of marine and hydrokinetic technologies, this report describes nine types of environmental effects that may occur and describes how monitoring and adaptive management principles might be employed to evaluate and mitigate those effects. There is no conclusive evidence that marine and hydrokinetic technologies will actually cause significant environmental impacts, and the possible effects detailed in this report should serve to highlight areas where further information and research is needed.

This Report to Congress was prepared based on peer-reviewed literature, project documents, and both U.S. and international environmental assessments of these new technologies. The information was supplemented by contributions from technology developers and experts in state resource and regulatory agencies as well as non-governmental organizations. Inputs and reviews were also provided by Federal agencies including the National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of the Interior (DOI), and the Federal Energy Regulatory Commission (FERC). This report focuses on potential impacts of marine and hydrokinetic technologies to aquatic environments (i.e., rivers, estuaries, and oceans), fish and fish habitats, ecological relationships, and other marine and freshwater aquatic resources. The report does not address impacts to terrestrial ecosystems and organisms that are common to other electricity-generating technologies (e.g., construction and maintenance of transmission lines) or possible effects on the human environment, including:

- human use conflicts
- aesthetics
- viewsheds
- noise in the terrestrial environment
- light
- recreation
- transportation
- navigation
- cultural resources
- socioeconomic impacts

The cultural and socioeconomic effects of these technologies on coastal communities and other users of rivers and oceans would need to be evaluated to fully understand the range of impacts associated with deploying marine and hydrokinetic technologies on the environment and to take advantage of opportunities for mitigation. The impacts could be addressed more fully in separate, focused reports.

Potential Environmental Effects of Marine and Hydrokinetic Energy Technologies

There are well over 100 conceptual designs for converting the energy of waves, river and tidal currents, and ocean temperature differences into electricity. Most of these ocean energy and hydrokinetic renewable energy technologies remain at the conceptual stage and have not yet been developed as full-scale prototypes or tested in the field. Consequently, there have been few studies of their environmental effects. Most considerations of the environmental effects have been in the form of predictive studies and environmental assessments that have not yet been verified. While these assessments cannot predict what if any impact a given technology may have at a given site, they have been instructive in identifying several common elements among the technologies that may pose a risk of adverse environmental effects:

- Alteration of current and wave strengths and directions
- Alteration of substrates and sediment transport and deposition
- Alteration of habitats for benthic organisms
- Noise during construction and operation
- Generation of electromagnetic fields (EMF)
- Toxicity of paints, lubricants, and antifouling coatings
- Interference with animal movements and migrations, including entanglement
- Strike by rotor blades or other moving parts

In the case of ocean thermal energy conversion technologies, additional potential effects stem from the intake and discharge of large volumes of sea water; changes in temperatures, nutrients, dissolved gases, and other water quality parameters; and entrainment of aquatic organisms into the intake and the discharge plume. Although there have been few environmental studies of these new energy conversion concepts, a preliminary indication of the importance of each of the environmental issues was gained from published literature related to other technologies (e.g., noises generated by similar marine construction activities, EMF emissions from existing submarine cables, environmental monitoring of active offshore wind farms, and turbine passage injury mechanisms examined for conventional hydropower turbines). Experience with other similar activities in freshwater and marine systems has also provided information about impact minimization and mitigation options applicable to these new renewable energy technologies.

Table ES-1 summarizes potential effects to aquatic environments from installation and operation of marine and hydrokinetic renewable energy technologies. As shown in the table, project installation, operation, and decommissioning would change the physical environment. These changes would in turn have effects on biological resources, potentially including alteration of animal behaviors, damage and mortality to individual plants and animals, and wider, longer-term changes to plant and animal populations and communities. The cells in Table ES-1 are color coded to reflect the possible need for further studies of an environmental issue as a part of project licensing. For some issues, existing information summarized in this report suggests that the potential effects are likely to be minor and may not require extensive investigation; these cells are colored green and marked with one triangle. Other cells are colored yellow or red and marked with two or three triangles, respectively, indicating an increasing possibility that further investigation may be needed at any particular site owing to a lack of information about a potentially greater environment effect. Regarding population-level and ecosystem-level responses (the last two columns in Table ES-1), there is insufficient information to make general statements about the seriousness of the effects for most projects. The need to study these higher-level environmental responses will hinge on the results of

early monitoring and plans for the eventual size of the project. The color coding is not definitive; in all cases, particular characteristics of the site or technology will ultimately be used to determine the environmental monitoring that will be needed.

At this time, there is a lack of data to address the potential cumulative impacts of multiple projects on the environment, particularly when combined with the impacts of other human activities in rivers and oceans. Because of this lack of information, it is important that cumulative environmental impacts be evaluated during the leasing and site-specific permitting of individual projects to ensure informed decision making and the implementation of needed mitigation measures.

Options to Prevent Adverse Environmental Impacts

Mitigation of environmental effects can involve (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (5) compensating for the impact by replacing or providing substitute resources or environments. Many of the Federal and state agencies that are concerned with environmental effects of energy development prefer to implement mitigation in the order listed, giving priority to avoidance of impacts, then minimization, and finally to restoration. The most certain way to mitigate potential impacts is to avoid environmentally sensitive areas. Such areas may be particularly fragile, exhibit high biological productivity or biodiversity, embody special cultural or environmental values (e.g., critical habitats for endangered species), or be vulnerable to major impacts from longer-range consequences like sedimentation. For biological resources, impacts are likely to be reduced by avoiding installation during sensitive seasons (e.g., during migrations of aquatic animals or reproductive periods for fish, marine mammals, and shorebirds). Structural and operational mitigation options are often unique to the technology or issue, and could include streamlining the shapes of non-generating structures, burial of electrical transmission cables, insulation against noise and EMF, protective screens to prevent entrainment or blade strike, and appropriate spacing of individual units or projects.

The Potential Role of Monitoring and Adaptive Management

Both monitoring and adaptive management have important roles in resolving the environmental issues associated with these new technologies. Some aspects of the environmental impacts will be unique to specific technologies or the environmental setting, requiring

operational monitoring to determine the extent of the effects. Because the environmental effects of these technologies are a function of both project design and site conditions, small projects sited in non-sensitive areas may not require extensive studies. On the other hand, large projects, especially those located in environmentally sensitive areas or in the presence of an endangered species, may be more likely to warrant substantial investigations. It should be emphasized that the potential significance of many of the environmental issues cannot yet be determined due to a lack of experience with operating projects. Also, the severity of these impacts could be increased by the cumulative effects of multiple units within a project, multiple projects, or energy projects coupled with other stressors. Potential effects on bottom habitats, hydrographic conditions, or animal movements that are inconsequential for a few units could become significant if large, multi-unit projects expand over large areas of a river, estuary, or the nearshore ocean. For some environmental issues, it will be difficult to extrapolate predicted effects from small to large numbers of units because of complicated, non-linear interactions between the placement of the machines and the distribution and movements of aquatic organisms. Assessment of these cumulative effects will require careful environmental monitoring as the projects are deployed.

The ability to modify a project in order to minimize and mitigate unacceptable environmental impacts identified by operational monitoring might be based on the application of adaptive management principles reflected in the project license conditions. In the context of marine and hydrokinetic energy technologies, adaptive management is a systematic process by which the potential environmental impacts of installation and operation could be evaluated against quantified environmental performance goals during project monitoring. Adaptive management allows for the repeated evaluation of monitoring results over time, in the context of specified outcomes. As projects expand from small, demonstration scales to commercial developments, the use of an adaptive management framework could be an effective means of resolving particular issues and addressing cumulative effects.

The Components of an Adaptive Management Program

The Federal agencies involved in licensing marine and hydrokinetic energy projects have procedures, rules, and/or guidance to help ensure sound and orderly development. Both FERC and DOI promote adaptive management as a tool to resolve uncertainties about environmental effects. The approaches toward adaptive management of proposed actions that are used by different organizations all share common components: definition and quantification of the desired outcomes, implementation, monitoring, evaluation, modification of the action, and re-evaluation through additional monitoring. Within this general framework, the adaptive management-related elements of energy project

licenses issued by these agencies can be tailored to the particular technologies and unique environmental settings. Further, public input to the licensing actions will help refine the adaptive management components and performance goals embodied in each project license.

Early information about undesirable outcomes of environmental monitoring could lead to the implementation of additional minimization or mitigation actions that could then be re-evaluated. The adaptive management process is particularly valuable in the early stages of technology development, when many of the potential environmental effects are unknown for individual units, much less for the build-out of large-scale projects. Basing project licenses and environmental monitoring programs on adaptive management principles, as advocated by many resource and regulatory agencies, will take advantage of ongoing research and monitoring to help refine technology designs and to improve environmental acceptability of future installations. The rapid dissemination of information will be an important part of this process.

This report was published by the US Department of Energy. The full report can be located at:

http://www1.eere.energy.gov/water/pdfs/doe_eisa_633b.pdf

THE MENTAL HEALTH & SUBSTANCE USE DISORDER TASK FORCE

Report to the President on Mental Health and Substance Use Disorder Parity

Introduction

Parity: Improving the Lives of People with Mental Health and Substance Use Disorders

Over the past eight years, our nation has made significant progress in increasing coverage for mental health and substance use disorders (together sometimes called behavioral health disorders). In 2015 the number of Americans with health insurance coverage was at an all-time high with close to 290 million people with health insurance coverage compared to 260 million in 2011. Because people with mental health and substance use disorders were among the most likely to be uninsured, a greater share of the increased access has been for these individuals. The Affordable Care Act (ACA) significantly expanded coverage of behavioral health care – mental

health and substance use disorder coverage is part of the Essential Health Benefit (EHB) package, recommended preventive screenings, including for depression and alcohol misuse, are available to people with non-grandfathered coverage with no cost sharing; and, in the 31 states and the District of Columbia that have expanded Medicaid, important mental health and substance use disorder services are now available to roughly 15 million more people than before the ACA was enacted.^{2 1} In this report “health insurance coverage” means insurance coverage or self-funded group health coverage of employers. Impacts of the Affordable Care Act’s Medicaid Expansion on Insurance Coverage and Access to Care. <<https://aspe.hhs.gov/pdf-report/impactsaffordable-care-acts-medicaid-expansion-insurance-coverage-aand-access-care>>

Health insurance makes a big difference. It provides security and enables people to seek care they might not otherwise be able to receive. In addition to dramatically expanding health coverage through the ACA, the Obama Administration has taken important steps to ensure that insurance coverage for health care services for mental health and substance use disorder is comparable to—or at parity with—general medical care. Broadly, parity laws and regulations aim to eliminate restrictions health plans place on mental health and substance use coverage – like annual visit limits, higher copayments, separate deductibles for mental health and substance use disorder services, and rules on how care is managed (such as pre-authorizations or medical necessity reviews) – if comparable restrictions are not placed on medical and surgical benefits.

President John F. Kennedy started the conversation about mental health parity more than a half century ago, when he directed the Civil Service Commission to offer equal insurance coverage for mental health and “general medical care” in 1961. Subsequently, mental health parity legislation was introduced in but not enacted by eight Congresses. At the time, the concept of parity was limited to coverage for mental health care and did not address substance use disorder benefits. More than 30 years later, the Mental Health Parity Act of 1996 made important strides by requiring the use of comparable annual and lifetime dollar limits for mental health and medical/surgical care. The Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act (MHPAEA or the 2008 parity law) finally became the law of the land in 2008, requiring full parity in financial and treatment limitations across most private group health plans and state and local government plans and extending parity protections to substance use disorders. The same overall standards are incorporated into separate statutory requirements for Medicaid managed care organizations. The Medicare Improvements for Patients and Providers Act of 2008 (MIPPA) included a provision to eliminate higher copayments for mental health

and substance use disorder services for Medicare beneficiaries. The ACA extended the protection of parity to individual insurance coverage and required mental health and substance use disorder benefit coverage by all non-grandfathered individual and small group health insurance. The combined reach of MHPAEA, the ACA and the application of parity in Medicaid plans has touched the health insurance coverage of approximately 174 million people.

The Obama Administration has taken a number of meaningful steps toward parity implementation, including:

- The Administration issued Interim Final Regulations to implement the Mental Health Parity and Addictions Equity Act in 2010 and Final Regulations in 2013, providing parity protections to an estimated 103 million people.
- The Affordable Care Act and its implementing regulations expanded parity protections to non-grandfathered plans in the individual and small group markets, covering an additional 48 million people.
- On March 30, 2016, the Department of Health and Human Services (HHS) published a final rule applying parity to Medicaid Managed Care, Children’s Health Insurance Program (CHIP) and Alternative Benefit Plans, expanding parity protections to about 23 million more people.
- In July 2015, CMS issued guidance on a new policy under section 1115 demonstration authority to develop a full continuum of care for individuals with SUD, including coverage for short-term residential treatment services not otherwise covered by Medicaid. This new opportunity is geared to support states engaged in broad and deep SUD system transformation efforts, enabling them to provide a full continuum of care by introducing service, payment and delivery system reforms to improve the care for individuals with SUD. In addition, CMS issued the Medicaid managed care final rule in May of 2016 which recognizes that managed care plans have flexibility in ensuring access and availability of covered services including short-term inpatient psychiatric and SUD treatment

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- As directed by MIPPA, between 2010 and 2014, the Centers for Medicare & Medicaid Services (CMS) phased out higher copayments for Medicare Part B mental health and substance use disorder outpatient treatments that were unequal to the copayments for other Part B services, effectively eliminating the disparate “mental health treatment limit” (as directed in MIPPA) for Medicare Part B and making copayments for Part B mental health and substance use disorder services generally the same as for other Part B services.
- In September 2016, the Department of Defense finalized a rule to modernize the mental health and substance use disorder benefits and provide parity under TRICARE, the insurance program covering 9.4 million service members and their families.
- From October 2010 to September 2015, the Department of Labor’s Employee Benefits Security Administration (EBSA) conducted 1,515 investigations related to the Mental Health Parity and Addiction Equity Act and cited 171 violations for non-compliance with these rules.
- Since the final Mental Health Parity and Addiction Equity Act regulations were issued in 2013, HHS, DOL and the Department of the Treasury (Treasury) jointly released tri-departmental subregulatory guidance. Including Frequently Asked Questions (FAQs) issued today, HHS, DOL and Treasury have released 44 FAQs and a compliance checklist, on parity issues ranging from disclosure requirements to application of parity to opioid use disorder treatment.

Federal regulators have supported enforcement activities at the state level by providing trainings and technical assistance and responding to inquiries. Collaboration with the National Association of Insurance Commissioners ensures that this support is targeted and effective.

Taken together, these steps provide important direct protections for the more than 40 million people – one in five American adults – who experienced some form of mental illness in the past year, and the over 20.2 million who had a substance use disorder. These protections are indirectly important for everyone, since over the course of their lifetimes, Americans face a 50 percent chance of needing behavioral health services.

Mental health and substance use disorder benefits make a difference. These disorders affect society in ways that go beyond the direct cost of care. Without effective treatment, people with these health conditions may find it difficult to find or maintain a job, may be less able to pursue education and training opportunities, may require more social support services, and are more likely to have their housing stability threatened. Mental illness can be particularly disruptive for families, as family members often serve as caregivers for loved ones with serious mental illness. Substance use disorders frequently rob the happiness, potential and lives of the people who have them and significantly strain family and friends. Comprehensive insurance coverage that is consistent with parity requirements can provide access to treatment and services, which in turn can reduce the difficulties faced by people with mental health and substance use disorders, help their loved ones, and increase their independence.

But there is more work to be done. The ongoing prescription opioid and heroin epidemic, as well as the rise in suicide and substance use-related fatalities in America, reinforce the importance of identifying and addressing challenges in implementing and enforcing behavioral health parity.

This report was published by the US Department of Health and Human Services. The full report can be located at: <http://www.hhs.gov/blog/2016/10/27/our-report-president-mental-health-substance-use-disorder-parity.html>

Unionization and Wage Inequality: A Comparative Study of the U.S., the U.K., and Canada

David Card, Thomas Lemieux, and W. Craig Riddell
NBER Working Paper No. 9473
January 2003

This paper presents a comparative analysis of the link between unionization and wage inequality in the United States, the United Kingdom, and Canada. Our investigation is motivated by several factors. One is to understand better trends in income inequality.

Several previous studies have concluded that falling unionization contributed to the steep increase in wage inequality in the U.S. and the U.K. that occurred in the 1980s. Wage inequality did not rise as quickly in these countries in the 1990s. This raises the question of whether the evolution of union coverage and union wage impacts can account for some of the changing trend in wage inequality. More generally, differences across these countries in the timing of changes in unionization and in wage inequality provide an opportunity for further assessing the contribution of institutional change to trends in income inequality. With the addition of questions on union status and wages to the U.K. Labour Force Survey (LFS) in 1993 and the Canadian LFS in 1997, it is now possible to use comparable large-scale micro data sets to examine the impact of unions on wages in the three countries. Estimates of the role of unionization in cross-country differences in wage inequality are no longer significantly affected by survey differences or by the limitations of small sample sizes.

Our study is also motivated by the fact that in these three countries the institutional unionization and collective bargaining provide an environment that is suitable for estimating the impacts of unions on wage inequality. As with other aspects of the economy, collective bargaining institutions in these countries are broadly similar. In particular, negotiations are conducted at the enterprise level, and there is no general mechanism to extend union wage floors beyond the organized sector. The fraction of workers covered by collective agreements in the three countries is also relatively modest – currently under one-third of wage and salary workers. Thus it is possible to compare the structure of wages for workers whose wages are set by union contracts, and those wages are not, and potentially infer the effect of unions on overall wage inequality. A similar task is far more difficult in other countries (including the major European countries and Australia) because there is no clear distinction between the union and non-union sectors. Collective bargaining in these countries is conducted at the industry or sectoral level, and the provisions are formally or informally extended to most of the labor force. Moreover, in many countries, unions exert considerable influence on political decisions (such as minimum wages) that directly effect labor market outcomes.

We also seek to assess whether there are common patterns in the impact of unions on the wage structure in countries with economies and industrial relations systems that are broadly similar. Of particular interest are patterns in union coverage and union wage impacts by gender and skill.

After briefly reviewing trends in union membership in the three countries, we begin by developing a simple framework for measuring the effect of unions on wage inequality, based on the potential outcomes framework that is now widely used in program evaluation. Our framework emphasizes three key aspects of collective bargaining coverage: How does the probability of union coverage vary for workers who would earn more or less in the non-union sector? How much do unions raise average wages for workers in different skill groups? How do unions affect the dispersion of wages within narrow skill groups?

We then use micro data samples to compare the incidence and average wage effect of unions by skill level on male and female workers in the three countries, and measure recent trends in union coverage by skill level. Despite some differences in the institutional systems that govern the determination of union status across workplaces in the three countries, we find remarkable similarity in the overall patterns of union coverage and

in the degree to which unions affect average wages of different skill groups. Within narrowly defined skill groups, wage inequality is always lower for union workers than non-union workers. For male workers, union coverage tends to be concentrated at the middle of the skill distribution, and union wages tend to be “flattened” relative to non-union wages. As a result, unions have an equalizing effect on the dispersion of male wages across different skill groups in the three countries, complementing the effect on within-group inequality. For female workers, however, union coverage is concentrated near the top of the skill distribution, and there is no tendency for unions to flatten skill differentials across groups. Thus, unions tend to raise inequality between more and less skilled women in the three countries, offsetting their effect on within-group inequality.

As a final step, we use data from the past 25 years to compute the changing effect of unionization on wage inequality. During the 1980s and 1990s, unionization rates fell in all three countries, with the most rapid decline in the U.K. and the slowest fall in Canada. These trends contributed to rising male wage inequality, particularly in Britain. Indeed, we estimate that the precipitous fall in unionization in the U.K. can explain up to two thirds of the difference in the trend in male wage inequality between Britain and the U.S.

This report was published by the National Bureau of Economic Research. The full report can be located at: <http://www.nber.org/papers/w9473.pdf>

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