Expanded Assistance Program for Lead in School and Early Education and Childcare Facilities Drinking Water

2020- 2022 Report

September 2023

Introduction

Since 1988 the Massachusetts Department of Environmental Protection (MassDEP) Drinking Water Program (DWP) has taken a proactive stance in addressing and eliminating lead in school drinking water. The MassDEP Lead in Schools and Early Education and Care Facilities Drinking Water Expanded Assistance Program (EAP) is a voluntary assistance program for public and private schools and licensed early education and childcare facilities (EECFs) that offers technical assistance with lead in drinking water testing, support for remediation actions, and outreach and education. Conducted in collaboration with the University of Massachusetts – Amherst, the program helps facilities develop a site-specific sampling plan, provides free laboratory analysis of samples taken at fixtures used for drinking and cooking, assists with the identification of fixtures with lead concentrations over the laboratory analytical testing limit of 1 part per billion[1] (ppb or µg/L) and recommends possible remedial actions. Upon completion of the program, facilities are provided with a certificate of completion to display. This report summarizes work completed through the program from when sampling commenced in March 2020 through December 2022.

Program Management

MassDEP-DWP directs the program with significant implementation assistance by UMass-Amherst through an interagency service agreement (ISA). MassDEP-DWP staff support consists of five staff allocating between 5-50% of their time. Approximately 15 part-time and full-time staff at UMass-Amherst are funded by the ISA. The funds for the ISA are from Water Infrastructure Improvements for the Nation (WIIN) Act grants that MassDEP received from the U.S. Environmental Protection Agency (USEPA). The Massachusetts Clean Water Trust funds testing at private schools. Between March 2020 and December 2022, expenditures for the program totaled $844,796- almost all of which were WIINs grant funds.

Outreach Activities

- ✓ Host quarterly educational webinars for schools and EECFs to describe the program and encourage participation.
- ✓ Send monthly outreach emails to schools and EECFs, in addition to two postcard mailers.
- ✓ Support multi-language outreach through translated materials and Spanish-language webinars and in-person seminars.
- ✓ Focus outreach efforts on communities designated by DPH as having children with high risk of lead poisoning (from all sources) and EJ communities.
- ✓ Engage with 10+ community partner organizations to assist with program outreach including the Department of Early Education and Care, the Department of Elementary and Secondary Education, MA Association of School Superintendents, MA Association of School Business Officials, Clean Water Action, and a chapter president of SEIU LOC 509 who assisted with engagement with Spanish speaking providers in EJ communities.
- ✓ Create several social media outreach efforts including an EAP Facebook page.
- ✓ Contracting with Health Resources in Action to develop an outreach and education plan and improve program materials.

Facilities Sampled

From March 2020 through December 2022, 499 facilities were accepted into the program (Figure 1) from 163 communities. More than 50% of the participating facilities were in environmental justice (EJ) communities and 10% were in both, EJ and communities identified as high risk for child lead poisoning according to the Department of Public Health (Figure 2). Almost all of the participating facilities (91%) were EECFs, while the remaining (9%) were schools (Figure 3). As of December 2022, 67% of the facilities had completed the program, 9% were in the process of completing the program, and 24% had withdrawn from the program (Figure 4)

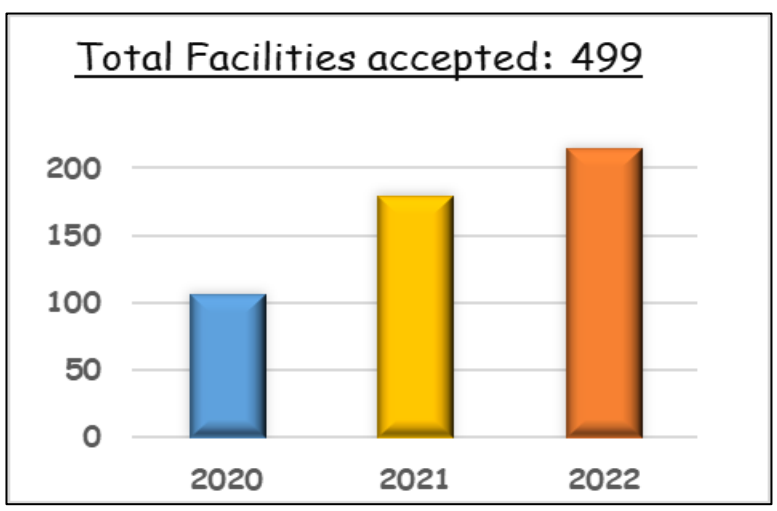

Figure 1: Facilities Accepted into the Program per Year

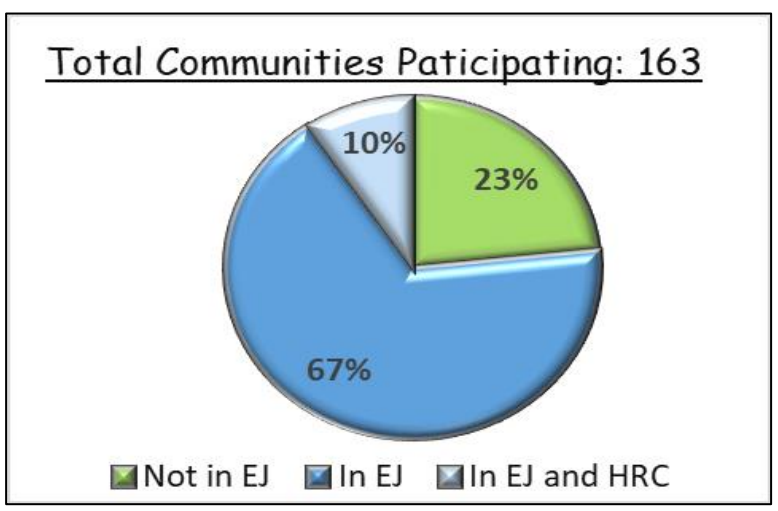

*Figure 2: Communities Participating in the Program. **EJ**= Environmental Justice community, **HRC**= High Risk for Child lead poisoning Community*

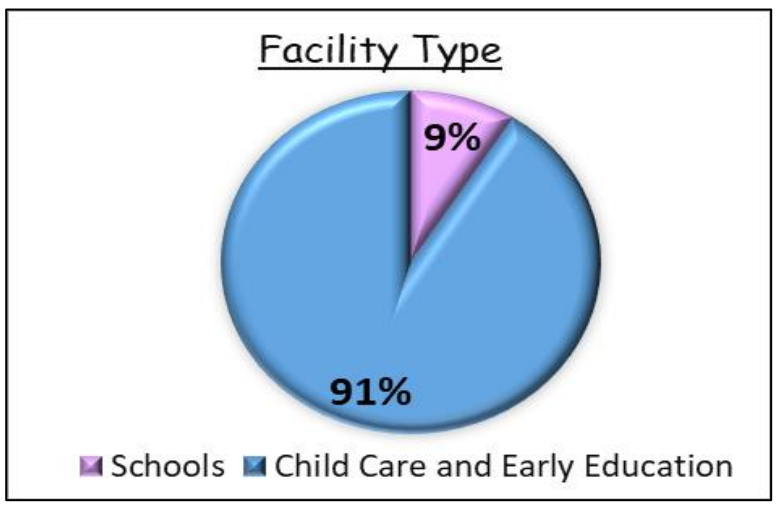

Figure 3: Percent of Facility Type Participating in the Program.

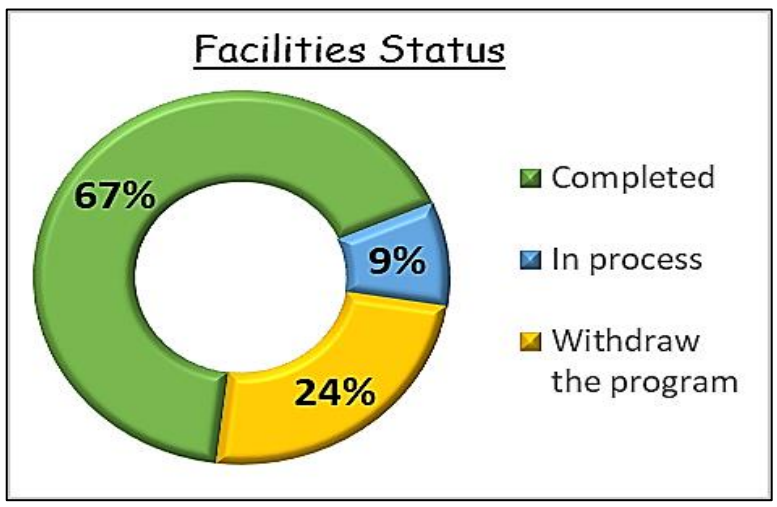

Figure 4: Facilities Status

[1] *.- MassDEP/UMass followed up with all facilities that withdrew from the program. Responses indicated that the pandemic greatly impacted their participation. During and after the pandemic, some childcare centers closed, while others experienced increased demand.*

Results

EAP collected 7,840 water samples from 30 schools and 302 EECFs. The majority of samples (76%) had no lead detected (ND)2 while 24% had levels recommending follow-up (see Figure 5). The majority of facilities (60%) however had lead detected in at least one sample (see Figure 6). A statistically significant difference (Welch's t(-7.42)= 79, p< 0.0001) between schools and EEC facilities with Lead detected over the laboratory detection limit was identified. More than 90% of the schools detected lead over 1 ppb in one or more samples, while only 64% of EEC detected lead over the laboratory detection limit (Figure 7).

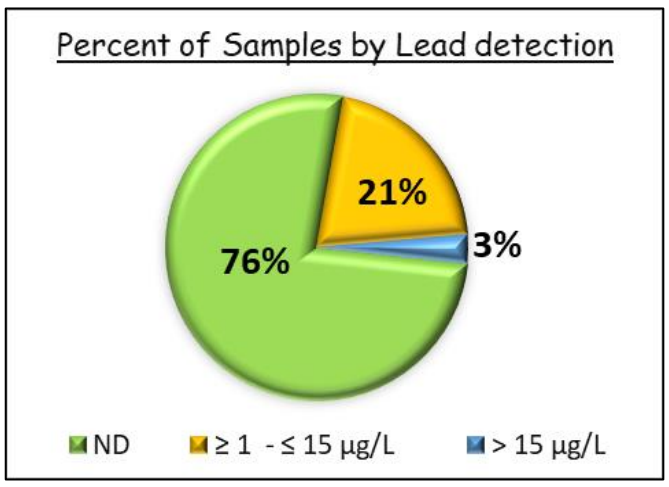

Figure 5. Percent of Samples by range of lead detection. ND= no detected.

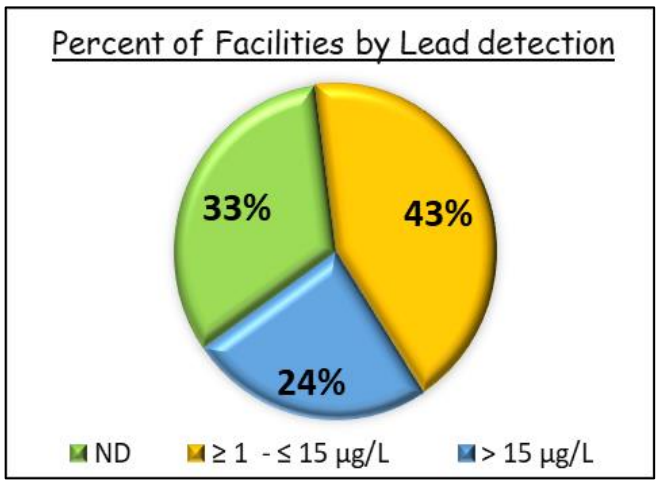

Figure 6. Percent of Facilities by range of lead detection. ND=no detected.

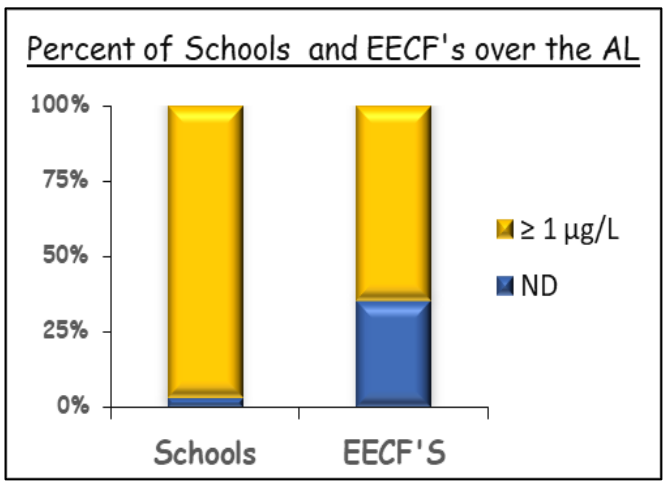

Figure 7. Percent of Schools and EECFs with lead detections. ND=no detected.

The two-way Analysis of Variance (ANOVA) method was used to investigate the impact of facility year of construction and sampling location on differences stated in schools and EECF's. The facilities were divided into two groups for the purposes of this study depending on whether they were built before or after the regulatory limitation on lead-containing plumbing materials3. It is notable that this classification produced no statistically significant differences (F(1) = 70.9, p = 0.08). This result is illustrated graphically in Figure 8, which shows that the vast majority of facilities in both groups were built prior to the implementation of the Lead regulation. Furthermore, the sampling locations were evaluated, and it was discovered that there is no statistically significant difference in this regard (F(8) = 1.9, p = 0.19). In accordance with this finding, the analysis reveals that more than 70% of the detections in both groups resulted from sources such as the Bathroom Faucet (BF), Classroom Faucet, and Kitchen Faucet, as shown in the Figure 9 and 10.

An analysis that compares facilities in Environmental Justice (EJ) communities with those in non-EJ communities reveals that there is no statistically significant difference in lead detection (Welch's t(-2.42)= 70, p=1.99). It's noteworthy that the distribution of lead detection levels is notable, with more than half of the facilities in both EJ and non-EJ populations showing lead detections over the 1 part per billion (ppb) threshold (see Figure 11). The reported lead results analysis provides an overview of the facilities that were sampled under the Extended Assistance Program from 2020 to 2022. However, in order to obtain a comprehensive statewide depiction and a better understanding, more parameters need to be included in the analysis. This includes characteristics such as geographical location and quality of water sources.

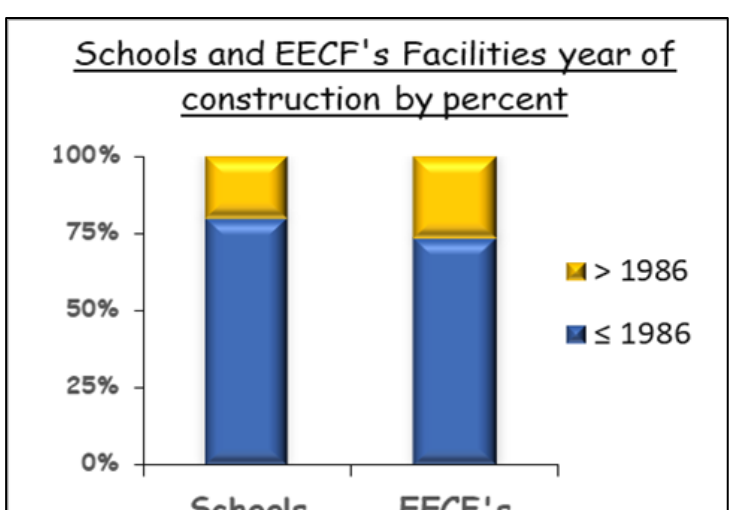

Figure 8. Schools and EEF's year of construction.

BF=Bathroom Faucet
CF=Classroom Faucet
KC=Kitchen Faucet
ORF=Other Rooms Faucet
DW=Drinking Water Bubbler
KK=Kitchen Kettle
NS=Nurse's Office Sink
OS=Outside Spigot.

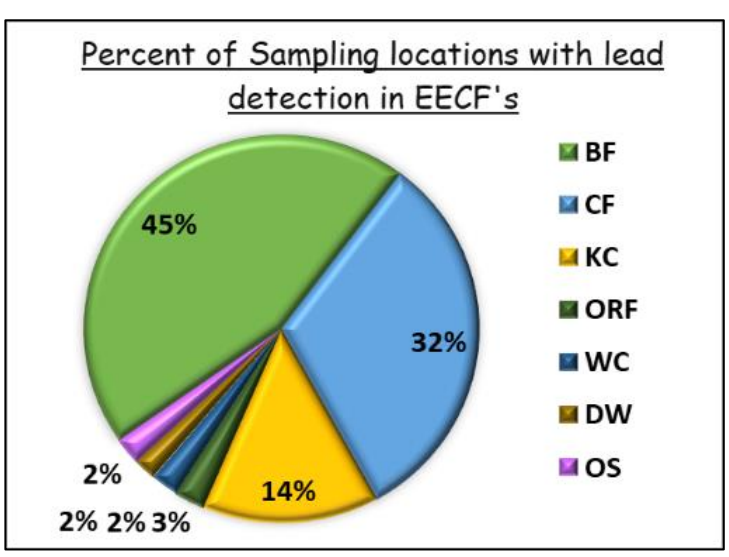

Figure 9. EECF'S sampling locations with lead detection.

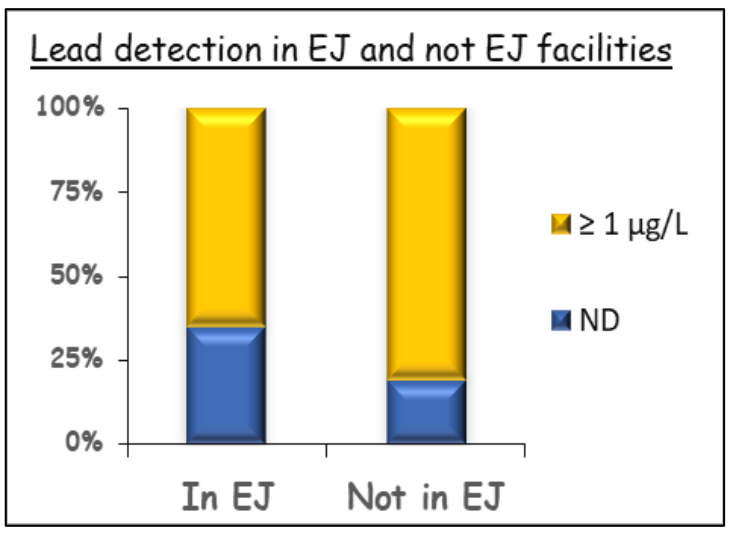

Figure 11. Percent of facilities in EJ and non-EJ communities with lead detections. ND= no detected.

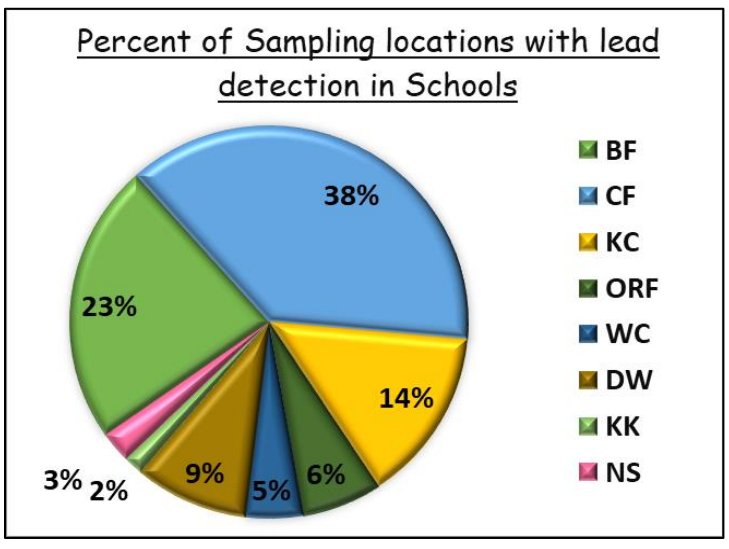

Figure 10. Schools sampling Locations with lead detection.

[1].- Laboratory analytical testing limit of 1 part per billion means below 1.45 ppb to three significant digits. [2].-ND means below 1.45 ppb [3].-On 1986 Safe Drinking Water Act (SDWA) Amendments limited the allowable concentration of lead in plumbing materials, including the banning of lead containing solder.

Remediation actions

After facilities receive their sampling results, they are encouraged to take remediation actions at any location with levels of lead above 1 ug/L and to communicate the results and follow-up steps to MassDEP, parents and staff. Figure 12 shows the different types of remediation actions taken.

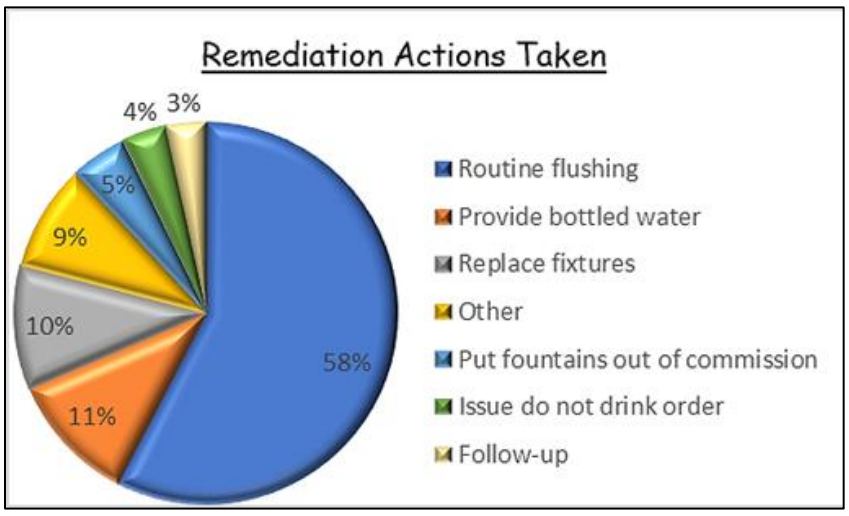

Figure 12. Remediation Actions Taken. Follow-up includes plan to resample and routine maintenance. Other includes added filtration or "use for handwashing only" sign posted.

Pilot Program

In 2021, MassDEP created a pilot program to partner with public water systems (PWS) located in communities designated by DPH as having children with high risk of lead poisoning (from all sources) to offer testing to schools and childcares ahead of upcoming requirements of the EPA Lead and Copper Rule Revisions. Eight PWS are actively participating in the program and as of August 2023, 49 public schools and 16 EECFs are participating in the program (Figure 13).

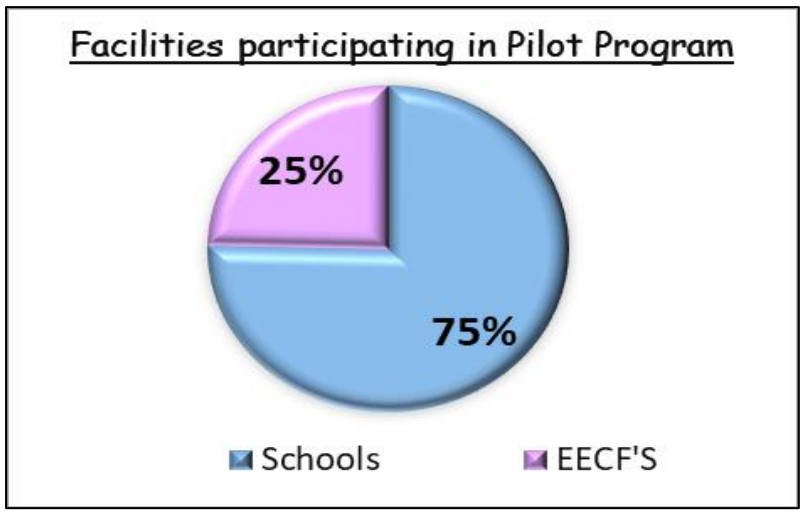

Figure 13: Facilities participating in Pilot Program.

More information:

- EAP Story Map: https://mass-eoeea.maps.arcgis.com/apps/MapSeries/index.html?appid=c8f635cf3a4b443998245f6045b4c013
- EAP Frequently Asked Questions Document: https://www.mass.gov/doc/assistance-program-questions-answers-for-schools-and-childcares/download
- EAP Webpage: https://www.mass.gov/service-details/technical-assistance-for-lead-in-school-and-child-care-center-drinking-water
- Lead and Copper in School Drinking Water Results: https://eeaonline.eea.state.ma.us/portal#!/search/leadandcopper
- MassDEP Drinking Water Program: program.director-dwp@mass.gov Subject: Lead in Schools drinking Water or 617-292-2770
- UMass-DEP LCCA-Program : lccadep@umass.edu, or 413-545-0840
- To apply online to the EAP program click here.

Report written and reviewed by Xochitl Perez[1] Postdoc Research, Hannah Parzen[1] EAP Program Coordinator, John Tobiason[1] Principal Investigator, Yvette DePeiza[2] DWP-Director and Michale Celona[2] EAP Program Manager.
UMass-Amherst[1], MassDEP –DWP[2]