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MATERNITY

Babies on board

Why US scientist-mums need support in the early years of parenthood.

BY KENDALL POWELL

In 2011, and again in 2014, Debbie Mitchell had extremely difficult childbirths. In the aftermath, Mitchell faced a lack of support that many early-career scientist-mothers in the United States experience — a situation that a lot of new mums find intolerable.

Mitchell had her first child while she was a PhD student in chemistry at the University of Denver in Colorado, and her second just before starting a one-year contract teaching position there. Neither position had a clear

maternity-leave policy. So when Mitchell experienced serious complications after each birth, she had to either work during her recoveries or lose her position — and her health insurance.

Naively, she says now, she had thought she'd be back at work after each birth in a few weeks, which is not unusual in the United States, one of just a few high-income countries without a federally paid family-leave policy. "But these were organizational problems," she says. "And there was no policy for when a graduate student or contract employee has a baby."

Mitchell returned to work just three weeks after the birth of her first child, only to face another common problem for early-career mothers — no private office in which to express breast milk using a pump. One day she found herself in a corner of the lab, pumping and sobbing. "These were things I really needed, and they would have been so simple to fix," says Mitchell, now a chemist at the University of Denver. "But there was no policy, and I wasn't prepared for how to talk about them or how to advocate for myself."

A spokesperson confirms that the university does not offer paid parental leave for graduate students or contract employees.

By no means does Mitchell's university stand alone in this respect. Many US research institutions have no clear policies on parental leave for graduate students, postdocs or contract employees. And that is mainly because there are no federal policies to follow, nor federal laws that enforce such policies for these worker categories. "We have nothing at a national level — no systematic guarantee of anything" for mothers, says Abigail Stewart, a psychologist at the University of Michigan, Ann Arbor and co-author of *An Inclusive Academy: Achieving Diversity and Excellence* (2018).

The most physically and emotionally demanding times of motherhood — pregnancy, delivery and recovery, and breastfeeding — often coincide with a female researcher's most intense push up the career ladder, from graduate studies to the first years in an independent position. This window of early motherhood also puts many female scientists at a distinct disadvantage compared with most of their male counterparts — one that is impossible to eradicate biologically. Instead, the female researchers *Nature* spoke to argue that stronger US national and institutional policies and support systems for scientist-mothers are needed to help level the playing field.

At universities across the United States, support provisions for mothers — paid-leave policies; well-appointed lactation rooms; on-campus, free or affordable childcare, flexible working hours and telecommuting options — vary enormously, and even across departments, resulting in piecemeal policies. Many of those provisions might not exist at all. And conferences put on by scientific societies and associations often lack basic necessities for new and nursing mums.

How does the United States compare with other high-income countries? At one end of the spectrum, Japan gives women two months of post-birth maternity leave at a reduced ►

► salary (and parents can take up to one year of childcare leave); at the other, Sweden gives parents up to 16 months of paid leave to split between them until the child is 8 years old. By contrast, the United States has the Family and Medical Leave Act (FMLA), which provides three months of unpaid leave for employees who meet certain conditions, and requires employers to continue to offer health benefits through that period.

And although the US Affordable Care Act and Title IX of the Education Amendments protect mothers' rights to breastfeeding support and to non-discrimination on the basis of pregnancy on campuses, respectively, they lack the teeth to enforce compliance. Instead, the system relies on already-overburdened women to file grievances or sue their employers.

"The academic system was designed by men, for men. What's not built in here are the things that women need," says Stewart. She notes that many universities now provide paid leave and relief from teaching duties for faculty members who give birth, adopt, foster or are the primary carer of a new child.

Although her own university also provides paid parental leave for postdocs, staff scientists and graduate students who are on a stipend, Stewart says that many other universities have no such policies.

"The policies apply only to principal investigators — and that is a very serious problem," Stewart says.

Early-career researchers such as graduate students and postdocs will need to find out their institution's and department's specific policies around maternity and parental leave, and how any leave would affect their pay and health-care coverage, as well as the options for childcare and whether there are dedicated spaces for expressing breast milk.

Some scientist-mums recommend preparing a plan to negotiate individually with research supervisors for parental leave, return-to-work arrangements, and managing periods of reduced productivity, so that expectations are mutually agreed and clear up front.

AT A LOSS FOR LEAVE

Parental leave for graduate students ranges from zero days off to three months of paid leave. Many women take two to three months leave, unpaid or otherwise, after childbirth before returning to part- or full-time work.

Researcher-mums say that transparency of institutional policies around family leave for graduate students and postdocs is imperative. US-based researchers including Mitchell say that only after becoming pregnant did they learn of their institution's policies, sometimes through an informal chat with an adviser who was unsure of the specifics.

Evolutionary biologist April Wright defended her dissertation at the University of Texas (UT), Austin, while nearly eight months pregnant. Like many US graduate students who are not classified as employees, she was not eligible for

leave under FMLA. Instead, she planned to take unpaid leave between earning her PhD and starting a postdoc. But she had to buy a US\$2,100 extension of her health insurance to cover herself and her child during those three months.

Now, graduate students at UT Austin can apply for financial assistance to cover their stipend and the cost of health-insurance coverage during unpaid parental leave of up to 12 weeks, should they need it, notes a university spokesperson.

A few institutions have introduced paid maternity leave for all PhD students. When Caitlin MacKenzie was an ecology PhD student at Boston University in Massachusetts, she was among the first students to use the university's eight-week paid parental leave policy in 2015. (As an example of piecemeal policies, Boston's faculty members get six weeks of paid childbirth leave, although they can take up to six months of paid medical leave if necessary, and have other benefits.)

MacKenzie, now a postdoc at the University of Maine in Orono and based in Boston, says that the policy gave her confidence to discuss leave with her supervisor and to believe that she was valued as a scientist.

The University of Wisconsin–Madison's chemistry department has provided paid parental leave for graduate students and postdocs since 2008. Birth mothers receive six weeks paid maternity leave, and any new parent, including birth mothers, partners and adoptive parents, receives another six weeks of paid leave. University gift funds support the periods of leave, and a 12-week combined leave taken by a birth mother costs about \$10,000, says chemist Robert Hamers, who was department chair when the policy was formally adopted. "We don't want women students or postdocs to drop out," he says. And, he adds, it makes financial sense to ensure that students complete their PhDs.

In sharp contrast, as an evolutionary-biology PhD student at the University of Ljubljana in Slovenia, Shakira Quiñones received a full year of paid maternity leave and a simultaneous 12-month extension of her PhD-requirement deadlines. She notes that the US academic system would do well to follow the country's cultural attitude — and some useful policies — regarding maternity leave. "Universities everywhere could allow for students taking a gap year after having a child."

In the absence of formal, longer-leave policies, many early-career US researchers must cobble together a leave plan that works for them. Marine ecophysicist Jacqueline Padilla Gamiño had her first child at the end of her postdoc at University of California, Santa Barbara.

After an initial six weeks of paid leave, she asked two mentors if they could pay her a

partial salary to finish two side projects and two publications from home while she took further unpaid maternity leave before starting a new position.

"Both of these women trusted me in a very vulnerable period of my life," says Padilla Gamiño. The work became a springboard for her to secure her current tenure-track position at the University of Washington in Seattle.

PRESSURE TO PRODUCE

Some US researchers still face tough choices around maternity absences and grant funding. Wright's second child was born at the end of her first year as a tenure-track researcher at Southeastern Louisiana University in Hammond, and her federal–state partnership grant could not be 'paused' to accommodate maternity leave. If she took three months leave, she would lose the remaining grant funds and have no scientific output for that part of the grant year.

She chose instead to work through the remainder of the grant, telecommuting ten days after her son was born, and relying on two employees to oversee research in the lab. It is crucial, she says, that more grants offer a no-cost extension, which would allow a principal investigator to extend the term of the grant if the funds were not spent during the initial term.

All US National Institutes of Health (NIH) R01 grants, the agency's most common funding scheme, include the no-cost extension mechanism. The NIH Office of Extramural Research says that many NIH-supported postdocs are entitled to two months of paid parental leave per year, regardless of their institution's policy. The "NIH is developing additional programmes and policies to promote the retention of female biomedical researchers," it adds.

But US federal funding agencies should be doing much more, argues Stewart. She notes that many faculty members who would like to support graduate students and postdocs through pregnancy and childbirth are constrained by pressure to produce results and maintain funding.

She says that funders could share the cost with institutions to cover leave for lab workers and relax productivity standards when a lab loses part of its workforce as a result of members' parenting obligations.

No-cost extensions don't compensate for the period of reduced productivity that comes when a principal investigator, postdoc or graduate student takes time off, Stewart says. "Motherhood is a legitimate reason for reduced productivity, but it is still a big battle in academia" to recognize it as such, she says. She calls for more supplemental-funding mechanisms such as the Primary Caregiver Technical Assistance Supplements, offered by the National Institute of Allergy and Infectious Disease, which gives principal investigators funds to hire a lab technician when a postdoc takes family leave.

Promotion and grant-review processes must also realistically address reduced productivity, Stewart argues.

"The policies apply only to principal investigators — and that is a very serious problem."



Female academic scientists in the United States face challenges in early motherhood.

Even with one of the most generous and well-supported maternity-leave policies in the world, Laurie Tomlinson, an epidemiologist at the London School of Hygiene and Tropical Medicine, didn't want to take the year she was entitled to off completely when her daughter was born. "I didn't want to distance myself, and I had all of these supports that enabled me to remain productive."

Those supports included a full extension of her grant, a paid research assistant who carried lab projects forward and a colleague who supported her students and helped to usher publications along. In the United States, Tomlinson says, institutions could ease the burden by reducing teaching loads after maternity leave, offering subsidized or 'back-up' childcare and providing mini-grants to bridge productivity gaps.

PUMPING PRIVACY

Researchers who return to work and are breastfeeding face still more hurdles. For doctoral students and postdocs, who often share offices, the lack of private spaces to express milk can cause physical distress. Successful pumping — which requires a break of 20–40 minutes every 2–4 hours for at least the first 6 months of a baby's life — maintains the milk supply and the mum's health.

Lactation rooms need a lock and a 'do not disturb' sign because a knock on the door can interrupt milk flow, say scientist-mums. Both interruptions and not having the opportunity to express milk when needed can mean clogged milk ducts, which can prolong time required for pumping or cause mastitis, a painful breast-tissue infection.

Many older US research buildings have no

lactation rooms (see go.nature.com/2utyxjz). MacKenzie describes pumping in a non-private room as among the hardest moments of new motherhood; she and Mitchell say that building managers could simply repurpose cupboard space for lactation privacy. Sarah Supp, an ecologist at Denison University in Granville, Ohio, says that an ideal lactation room includes ample space for pumping, dimmable lights, a comfortable chair, a desk or table close to electrical outlets, labelling supplies, a refrigerator or freezer to store milk, a sink, wipes or paper towels, and a rubbish bin.

Supp recommends that scientist-mums make their lactation-room needs clear when interviewing for jobs or giving seminars at other universities. "Be direct and professional and protect your time and your own comfort," she says.

TOTS IN TOW

Travel adds another layer of complication to childcare for early-career mums, but is crucial to career advancement. Some researchers have turned to social media to flag the lack of family-friendly policies.

At the annual conference of the American Society for Radiation Oncology (ASTRO) last October in San Antonio, Texas, radiation oncologist Emma Holliday had planned to present a poster at the meeting. But on arriving at the venue with her infant son in a carrier, she tweeted: "Childcare plans fell through last minute and had to bring my 6mo old along to register at #ASTRO18. Unfortunately, we were denied entry by the bouncers at the exhibit hall ... Bummer."

Her tweet garnered multiple replies of solidarity and support from female scientists who were outraged that she had been denied a

chance to showcase her research. The tweet also summoned ASTRO spokesman Jeff White, who found Holliday in a common area and tried to make amends. Holliday, who works at the University of Texas MD Anderson Cancer Center in Houston, had already missed the poster session, so White arranged for her to return the next day and tweeted the schedule change.

Laura Thevenot, ASTRO's chief executive in Arlington, Virginia, says that the society's conference has provided lactation rooms since 2011, and that ASTRO tried to provide on-site childcare for attendees at last year's meeting, but too few people signed up. In 2019, she says, the society will explore other options, including providing participants with lists of nearby childcare centres that offer drop-in services, and hotels that offer childcare.

"We are looking for ways to be flexible," she says. That includes allowing exceptions to the 'no one under 18' rule that barred Holliday from attending her own poster session, and offering free access to the conference's common spaces for carers to allow quick infant handovers.

Many scientist-mums say that conference organizers need to promote family-friendly policies such as these well in advance on conference websites, so that mums can make an informed decision about travel. If the policies aren't visible, women might forgo attending, sacrificing crucial networking time with colleagues.

Some institutes and societies provide financial support for childcare during conference travel that could cover a carer's travel costs, local childcare at the conference or childcare at home.

Stewart says student and postdoc parents need guaranteed leave and continued health benefits, along with the opportunity to extend degrees and grants, and a change to attitudes regarding the accommodation of parenting duties. US-based postdocs and students can find pregnancy- and breastfeeding-related information and frequently asked questions at <https://thepregnantscholar.org>. Campuses, Stewart says, should also consider more substantial policies, such as arrangements for part-time work and subsidized, on-site childcare for all scientists who need it.

"Of course these are tough things to ask institutions when there is a lack of a national policy," she says, adding that institutions should lobby US Congress for such a policy. But she also encourages institutions to do a financial analysis of family-friendly policies. When the University of Michigan considered the cost of its family-leave policy for faculty members across a 30-year career timeline, the policy was clearly an affordable way to support women. In London, Tomlinson has seen similar long-term investments pay off. "Our institution has seen that this is a commitment worth waiting for," she says. "If you support women in those early years, they will repay that with huge output later." ■

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